

**SONY®**

VIDEOCASSETTE RECORDER

**BVU-820**



**U-matic**

Professional

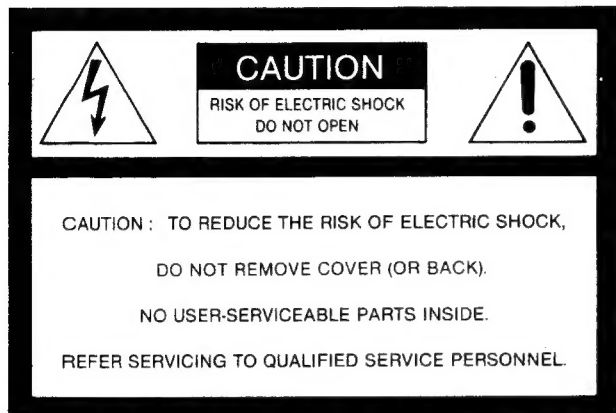
OPERATION AND MAINTENANCE MANUAL

2nd Edition (Revised 10)

Serial No. 10746 and Higher

## WARNING

To prevent fire or shock hazard, do not expose the set to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**Warning**—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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## SECTION 1 OPERATION

### 1-1. FEATURES

#### Quick access to the edit points

Search functions providing a recognizable picture in the shuttle mode (in which the playback speed can be varied from 1/30 to 10 times normal speed in both forward and reverse) and the jog mode (in which the picture moves as the search dial moves), enable operators to locate the edit point more quickly. Also in the fast forward and rewind mode, the tape is threaded around the drum and a recognizable picture can be obtained using a time base corrector.

#### Edit functions

In the assembly edit mode, the video, audio channel 1 and channel 2 signals can be edited simultaneously. In the insert edit mode, the video, audio channel 1 and channel 2 signals can be edited independently. The edit material can be viewed before and after recording.

#### Front access

Every operation, including cassette insertion and removal, is performed from the front panel, which can be tilted to individual's preference up to 90° (6 steps).

#### Remote control

When editing using two BVU-820 video cassette recorders, the front panel controls of the recorder, which can be detached, can also remotely control the player.

#### Time code recording/playback function

The tape has a special channel, the address track, which allows the SMPTE time code to be recorded and played back without sacrificing an audio channel with a time code generator and reader.

#### $\phi^2$ (Phi square)-servo loop circuit

The BVU-820 feature prevents picture disturbances ("flagging" or "whipping") at the edit point, since it ensures proper H-phase and frame phase alignment. The H-phase alignment is performed automatically.

#### Capstan servo

The BVU-820 incorporates a capstan servo circuit which locks onto the external signal.

#### Framing servo

This identifies each even and odd field in a given frame, and ensures that edits occur precisely between the end of an even field and the start of the next odd field, for clean edits.

#### Direct drive system with six DC motors

Six motors are mounted independently in the BVU-820. Brushless DC motor, directly coupled with the drum assembly and newly developed brushless DC motor, is employed to the capstan assembly. Since the supply reel and the take-up reel are driven by the independent motors and the tension on the tape is precisely set by a servo system, quick access can be made.

#### Dynamic tracking® playback

The playback picture without guard band noise can be seen in still mode, jog mode and shuttle mode of -1 to +3 times normal speed.

#### Video monitor function

The recorded picture can be simultaneously played back while recording or editing is being performed.

#### Digital time counter

The time counter indicates the amount of tape advancement at normal speed in hours, minutes, seconds and frames by counting the CTL signals. It can also indicate the lap time of editing.

#### Automatic/manual video recording systems

System provides a choice of either AUTO or MANUAL video recording level control.

#### Audio system

The audio recording and playback levels can be adjusted separately. If necessary, a limiter can be activated so that virtually distortion-free recordings of sudden, very strong input signals can be made. The CH-1 and CH-2 audio signals can be mixed while recording.

#### Editing/duplicating connectors

DUB IN and DUB OUT connectors permit editing and duplicating of video signals with little degradation, even over several generations.

#### Time base corrector (TBC) connection

The BVU-820 is provided with an external subcarrier input connector (SC IN) and an external sync input connector (EXT SYNC IN) which allow it to be connected to a time base corrector. It is also possible to connect an external dropout compensator (from a TBC, etc.) to the BVU-820's RF OUTPUT connector. A time base corrector such as a BVT-800 can be connected with a multi-core cable.

#### Auto rewind/auto stop

Auto rewind function automatically rewinds the tape to the beginning at the end of the tape. Auto stop function automatically stops the tape at the top of the tape.

#### Indicator lamps

These lamps are conveniently located on the front panel, notifying the operator of the conditions of the framing servo lock, of internal moisture condensation, time code recording/playback and of the operation of the capstan and drum servo lock.

#### Plug-in boards and modules

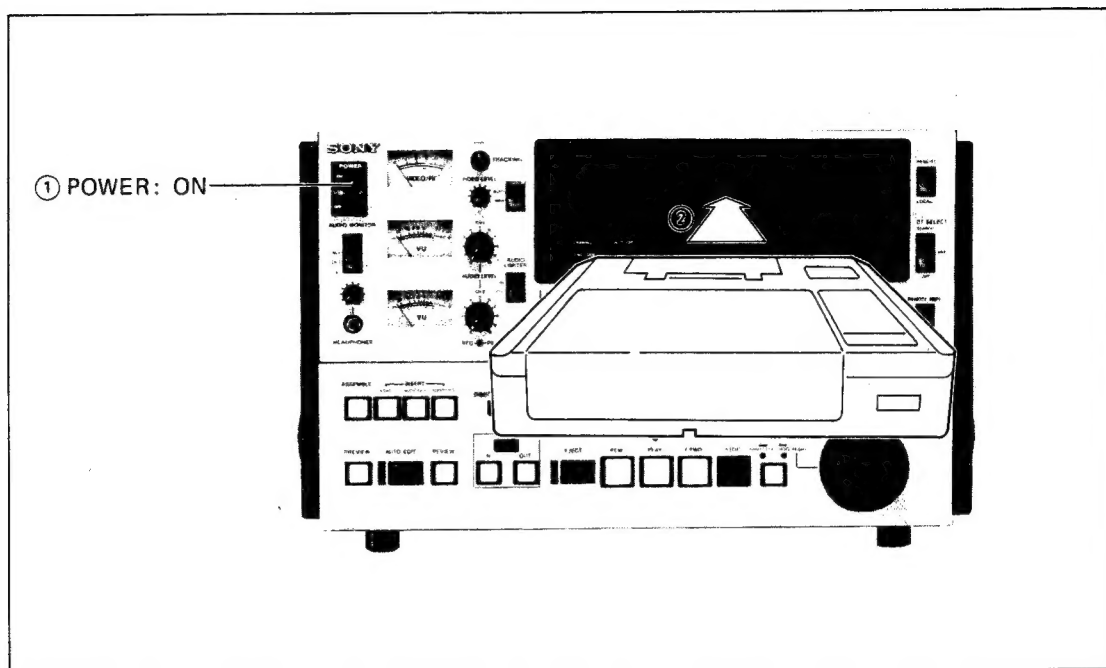
Plug-in boards and modules are designed for the ease of the service and maintenance by simply removing the top panel.

#### Mountable in standard 19" rack

The BVU-820 is mountable in a standard EIA 19" rack.

## 1-2. CASSETTE INSERTION AND REMOVAL

### TO INSERT A CASSETTE.

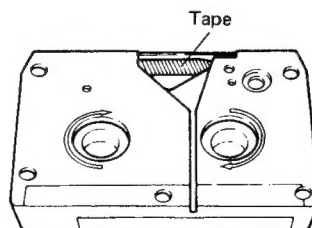


- The tape will be automatically threaded, the drum will rotate and a still picture will be displayed.

### TO REMOVE A CASSETTE

Press the EJECT button while the POWER switch is set to ON.

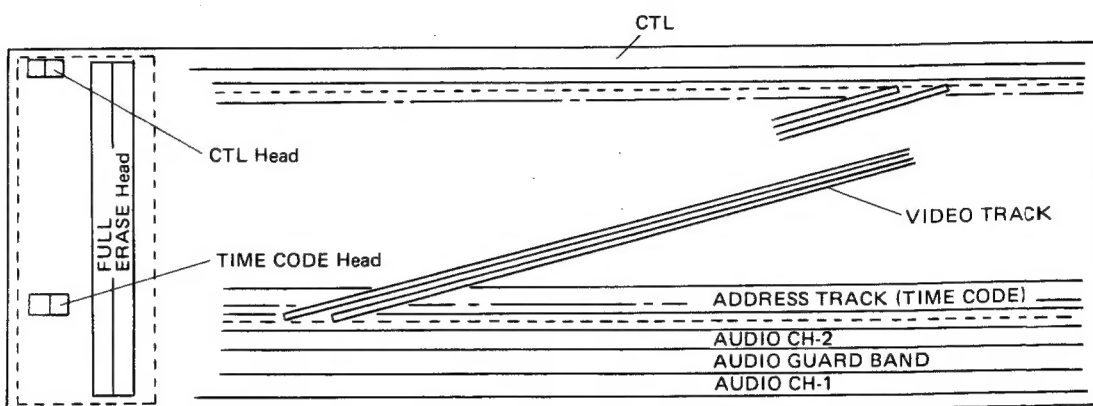
- Notes:**
- Use Sony U-matic (or its equivalent) type KCA-60 (60 minutes) and KCS-20 (20 minutes) video cassette tapes with this machine.
  - **Remove the cassette after every use before the power is turned off.**  
If you have turned off the power with the cassette in, turn on the power (The EJECT lamp will light for a moment and then the STANDBY and the STOP lamp will light.) After the STOP lamp lights, press the EJECT button to eject the cassette.
  - When over wound tape cassette is threaded, the machine automatically detects it and goes into fast forward or rewind mode in order to prevent accidental head tip damage by the leader tape. Only if a KCA cassette in which the leader strip of the tape end has accidentally been drawn out is inserted, the cassette will be automatically ejected. In this case, turn the supply reel by hand until the end-leader strip is wound onto the supply reel and re-insert the cassette.



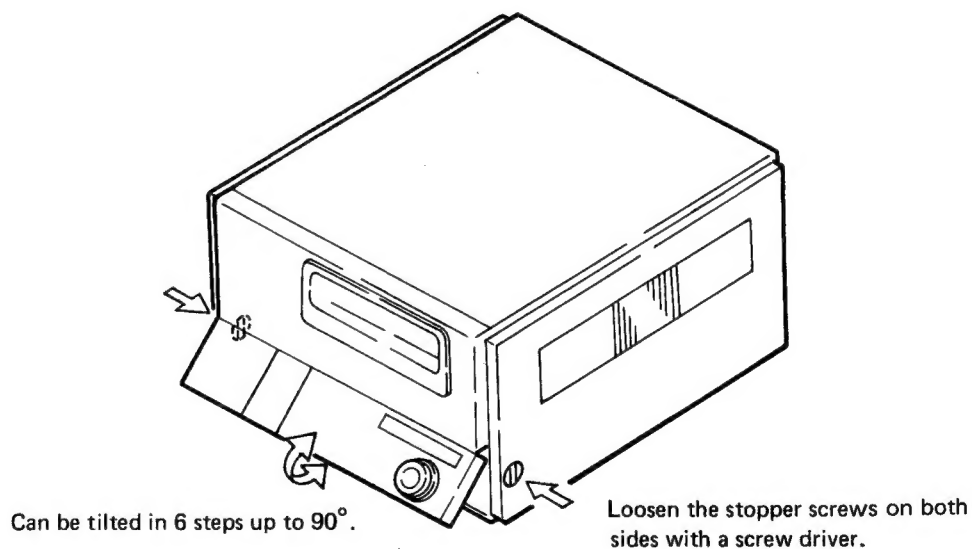
### To keep a recorded program from being accidentally erased

Remove a small round red cap on the bottom of a cassette, so that the record function cannot be activated. If you wish to record on a cassette which has had the cap removed, replace the cap again. In normal use, keep this cap in place.

- The illustration below shows the tape pattern recorded using this machine with the time code generator.



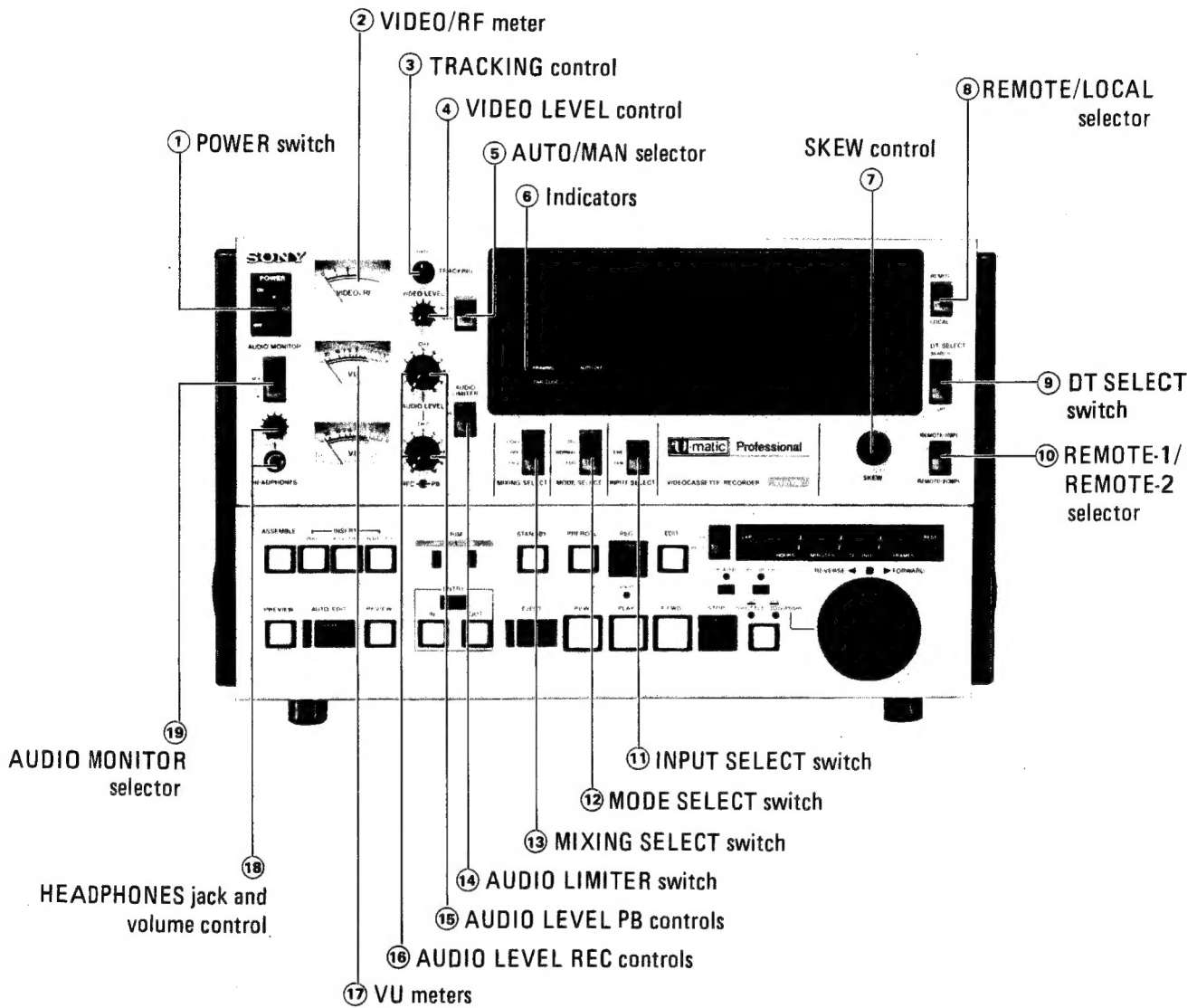
### CONTROL PANEL POSITIONING

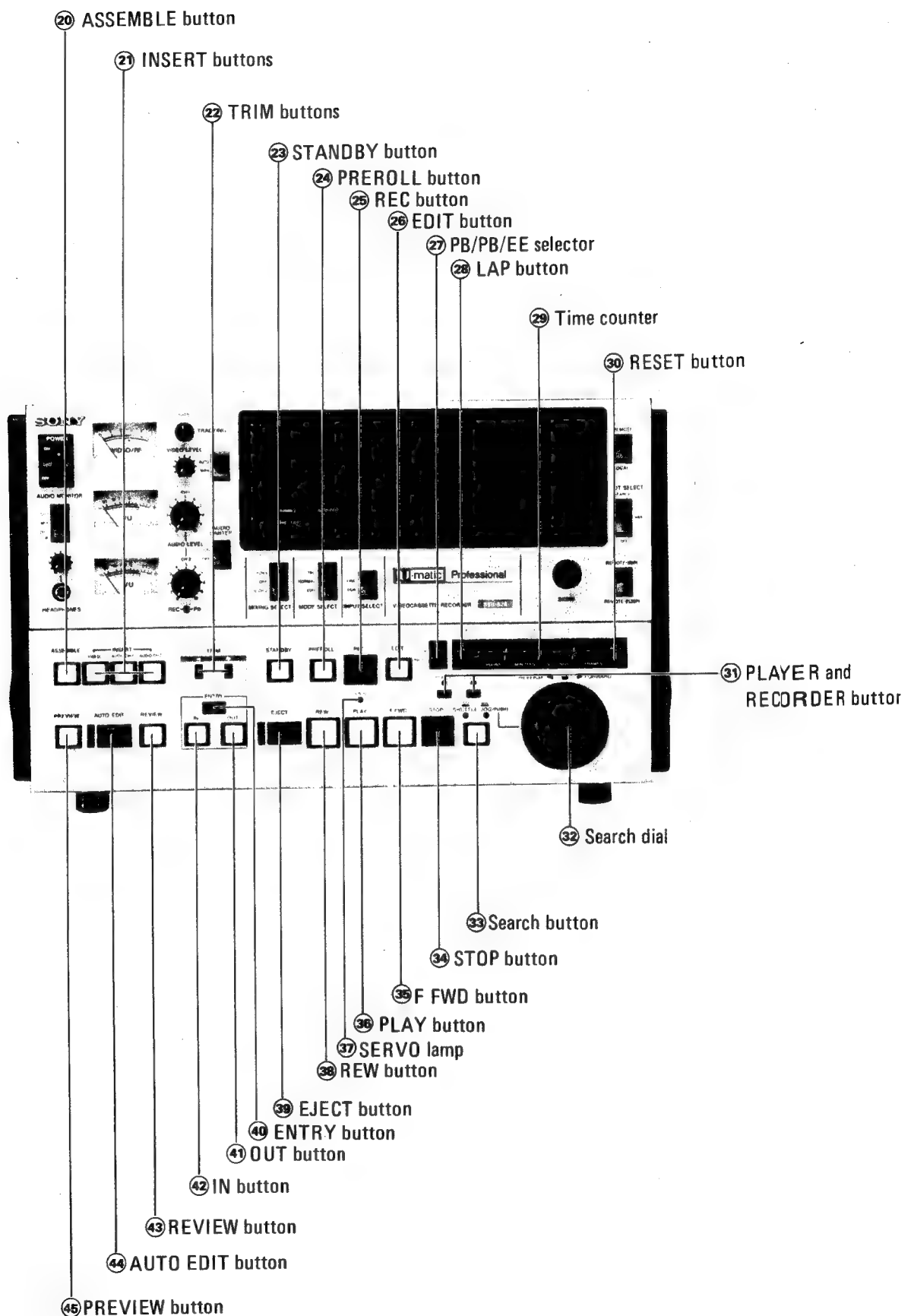


- The control panel can be detached for full function remote control by cable. For details, see section 2.

### 1-3. LOCATION AND FUNCTION OF CONTROLS

#### FRONT PANEL





**20 ASSEMBLE button**

Press this button to set the unit in the assembly edit mode. Pressing the button turns it on and pressing it again turns it off.

When this button is pressed, the R/P head will function even if the DT SELECT switch is set to VAR or SEARCH.

**21 INSERT buttons**

Selects the input signal for insert editing. Pressing the button turns it on and pressing it again turns it off.

When this button is pressed, the R/P head will function even if the DT SELECT switch is set to VAR or SEARCH.

**22 TRIM buttons**

The memorized edit-in and edit-out points can be moved any number of frames. While pressing the IN or OUT button, press the appropriate button.

**23 STANDBY button**

While the power is on, the STANDBY lamp is lit indicating that the drum rotates and the unit is in the standby mode.

When this button is pressed during the stop mode, the drum will stop rotating and the tension on the tape is slackened, which protects the video head from being clogged. To put the unit in the stop mode or in other function mode, press the STANDBY button or the desired function button (except the STOP button).

**24 PREROLL button**

Press this button to run the tape at high speed to a preroll point 5 seconds (or 7 seconds depending on the setting of the preroll time switch) prior to the edit-in point.

If the edit-in point has not been entered and this button is pressed, the point where the button has been pressed will be entered as the edit-in point and the preroll will proceed.

**25 REC (record) button**

Press this button and the PLAY button simultaneously to set the unit in the record mode.

While this button is pressed in the play, search, fast forward or rewind mode, the E-to-E mode video and audio can be monitored. Release the button to set the unit in the same mode as before the button was pressed. In the stop mode, the E-to-E mode picture and audio are kept monitored when the button is pressed and released. Press the STOP button to set the unit in the previous mode.

**26 EDIT button**

Press this button and the PLAY button simultaneously for manual editing.

While this button is pressed in the play, search, fast forward or rewind mode, the selected E-to-E mode video and audio can be monitored. Release the button to set the unit in the same mode as before the button was pressed. In the stop mode, the selected E-to-E mode picture and audio are kept monitored when the button is pressed and released. Press the STOP button to set the unit in the previous mode.

**27 PB/PB/EE selector**

Selects the video and audio to be monitored. When the PB/PB/EE selector is set to PB, the simultaneous playback picture can be seen in the record or editing mode. For details, see the table on page 1-15.

**28 LAP button**

When this button is pressed, the lap time will be indicated by the time counter.

**29 Time counter**

Indicates how much the tape has advanced at normal speed in hours, minutes, seconds and frames.

**30 RESET button**

Press this button to set the counter number to "0:00:00:00". The memorized counter numbers of edit-in and edit-out points are cleared when this button is pressed.

**31 PLAYER and RECORDER buttons**

When two BVU-820s, or a BVU-820 and a BVU-800 are connected for editing, the PLAYER button on the recorder is used to remotely control the player.

RECORDER button: Press this button to use the function buttons on the recorder in the usual way.

PLAYER button: Press this button so that the standby, eject, fast forward, play, rewind, stop, shuttle, jog, preroll, entry in/out, trim and time counter functions of the player can be remotely controlled with the buttons on the recorder.

**32 Search dial**

This dial is used to quickly locate the desired editing points.

Pressing the dial in sets the unit in the jog mode and pressing it again sets the unit in the shuttle mode. The appropriate lamp lights.

SHUTTLE: Rotate the dial to the right or left and the tape runs in forward or reverse direction at a speed corresponding to the dial setting. The possible playback speed is as follows: When the DT SELECT switch is set to SEARCH or OFF, 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 10 times in either direction. At the click position, tape speed is 10 times normal speed and at the center position, a still picture is obtained.

When the DT SELECT switch is set to VAR,

At the fully clockwise position, 3 times normal speed in forward direction, at the center position, a still picture and at the fully counterclockwise position, normal speed in reverse direction is obtained.

JOG: Rotate the dial to the right or left. The tape moves in the direction and at the speed of rotation, from 0 to 1 normal speed. When you stop rotating the dial, a still picture will be obtained.

- When the power is turned on, be sure to set the dial to the ■ position once before it is used.



**③③ Search button**

Press this button to set the unit in the search mode.

**③④ STOP button**

Press this button to set the unit in the stop mode. The reel motor stops, the pinch roller is released, the drum rotates and the tape is threaded.

On a still picture, guardband noise may appear even if the DT SELECT switch is set to VAR or SEARCH.

**③⑤ F FWD (fast forward) button**

Press this button to advance the tape rapidly.

**③⑥ PLAY button**

Press this button to play back the tape.

Press this button and the REC button simultaneously to record.

During playback press this button and the EDIT button simultaneously to edit manually.

During manual recording, press this button to stop the recording.

**③⑦ SERVO lamp**

This lamp lights when the drum servo and the capstan servo are locked.

**③⑧ REW (rewind) button**

Press this button to rewind the tape.

**③⑨ EJECT button**

When this button is pressed, the tape is unthreaded and the cassette is ejected.

- Be sure to eject the cassette after every use before the power is turned off.

**④① ENTRY button**

Press this button and the IN or OUT button simultaneously to enter the edit-in or edit-out point.

**④② OUT button**

When this button and the ENTRY button are pressed simultaneously, the edit-out point will be entered.

When this button is pressed, the edit-out point frame number will be displayed on the time counter.

**④③ IN button**

When this button and the ENTRY button are pressed simultaneously, the edit-in point will be entered.

When this button is pressed, the edit-in point frame number will be displayed on the time counter.

**④④ REVIEW button**

Press this button to review the edit-recorded picture and sound.

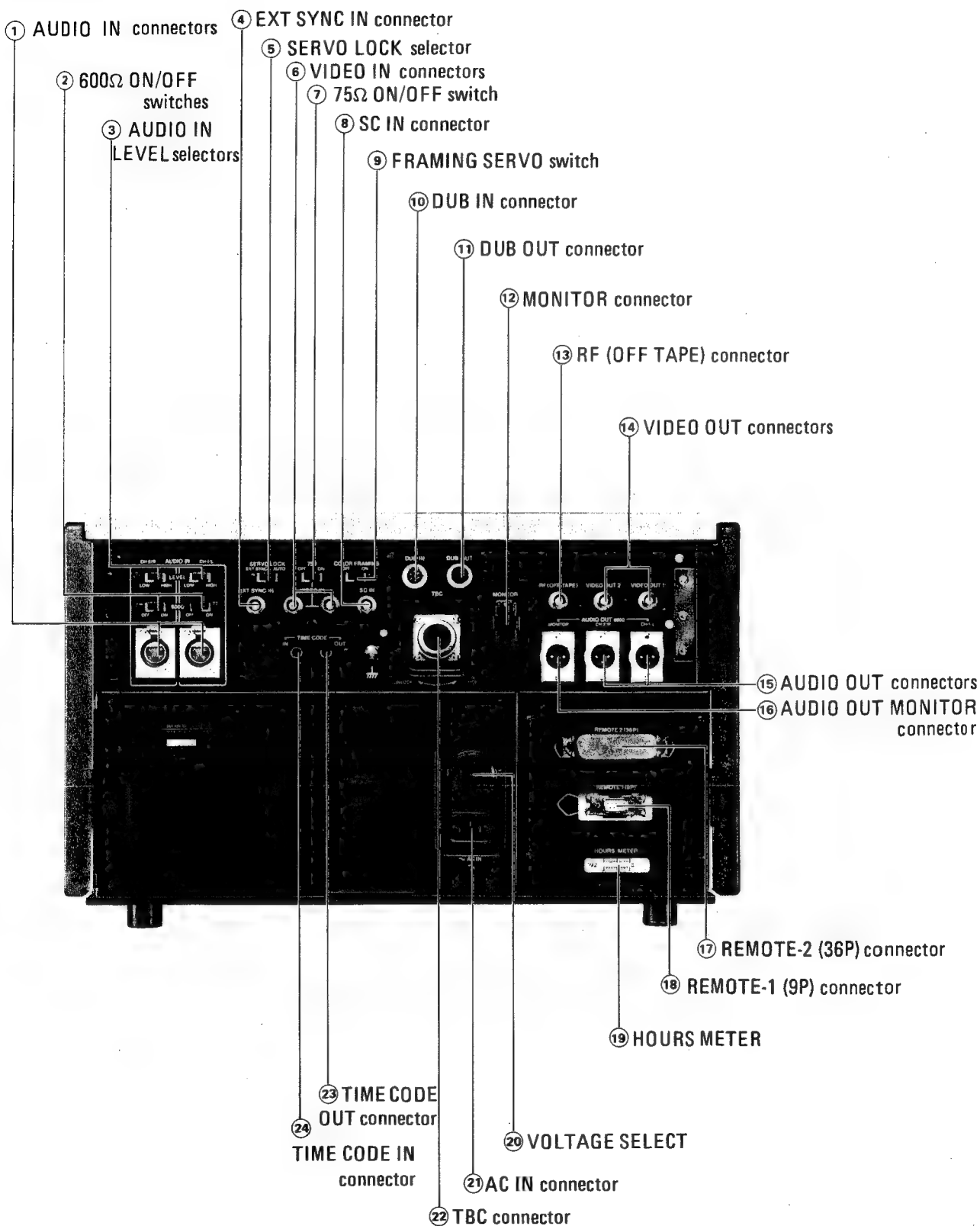
**④⑤ AUTO EDIT button**

Press this button for automatic edit-recording.

**④⑥ PREVIEW button**

Press this button for an edit-recording rehearsal. The edited tape to be recorded can be monitored prior to the actual recording.

# REAR PANEL



## 1-4. RECORDING

### 1. PREPARATIONS

Set the controls to the appropriate position as follows.

**AUDIO IN LEVEL:** LOW or HIGH

LOW: -60 dB, 3 k-ohms (for mic connection)

HIGH: +4 dB, 10 k-ohms/600 ohms (for line use)

When this switch is set to this position, set the 600  $\Omega$  switch as follows.

ON: 600 ohms

OFF: 10 k-ohms

**75  $\Omega$  ON/OFF:** ON

When a looping output is employed, set this switch to OFF.

**FRAMING SERVO:** ON

When recording the signal with no framing, set this switch to OFF.

**SERVO LOCK:**

AUTO:

Normal position

EXT SYNC:

For external sync  
(See page 1-16.)

Rear panel

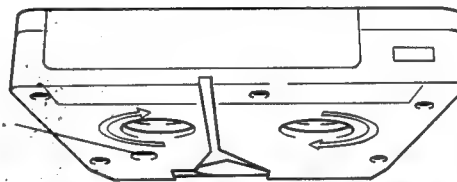
Audio input

Video input

AC power

to monitor

For connections, see page 1-54.



Insert a video cassette

The red cap should be placed.

**TRACKING:** FIXED

**POWER:** ON

**AUDIO MONITOR:**  
MIX, normally

**REMOTE/LOCAL:**  
LOCAL

Front panel

**MIXING SELECT:** OFF, normally

**MODE SELECT:** NORMAL

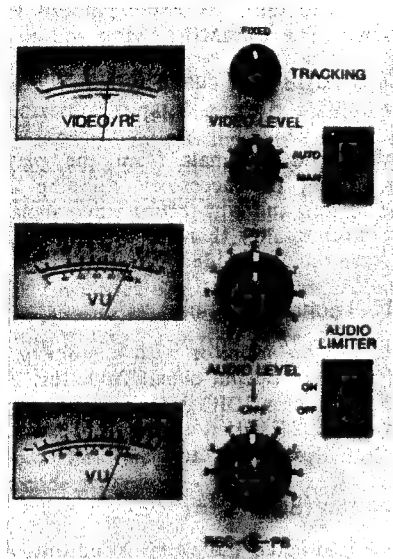
**INPUT SELECT:** LINE or DUB

LINE: The video signal of the unit connected to the VIDEO IN connector will be recorded.

DUB: The video signal of the player connected to the DUB IN connector will be recorded.

**PB/PB/EE:** PB/EE, normally

## 2. VIDEO AND AUDIO LEVEL ADJUSTMENTS



### Video level

To adjust the video level automatically, set the VIDEO LEVEL switch to AUTO.

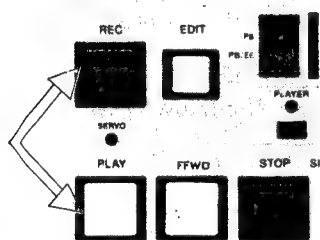
To adjust the video level manually, set the VIDEO LEVEL switch to MAN and turn the VIDEO LEVEL control so that the meter's pointer is within the blue zone.

### Audio level

Set the AUDIO LIMITER switch to OFF. Adjust the AUDIO LEVEL controls for channels 1 and 2 so that AUDIO LEVEL meters read approximately zero at the maximum deflection.

If you want to record audio using the limiter, set the AUDIO LIMITER switch to ON.

## 3. TO START RECORDING



Press the REC and PLAY buttons simultaneously.

It takes several seconds for the drum and capstan servo to lock. The servo lamp will light.

The lamps lit: REC, PLAY, STANDBY

To stop recording, press the STOP button.

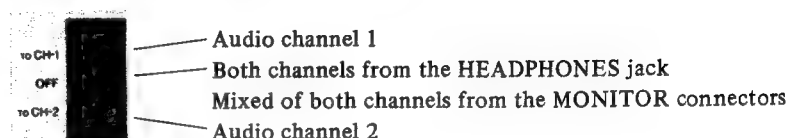
The lamps lit: STOP, STANDBY

If the tape reaches the end, it will automatically rewind to the beginning and stop.

## TO MONITOR VIDEO AND AUDIO SIGNALS

**Video signals:** Can be monitored with a monitor connected to the VIDEO OUT connector or the MONITOR connector.

**Audio signals:** Can be monitored with audio systems connected to the AUDIO MONITOR connector, with a monitor connected to the MONITOR connector, or with a stereo headphones connected to the HEADPHONES jack. The signals to be monitored can be selected by using the AUDIO MONITOR selector as follows.



## SETTING THE PB/PB/EE SELECTOR

This selector selects the picture and audio on the monitor.

Mode Selector position	Cassette up	Threading or unthreading	Play	Record	Edit	Search	Fast forward or rewind	Stop	When the standby mode is turned off
PB	EE	EE	PB	Video: Simul- taneous PB Audio: EE	Video: Simul- taneous PB Audio: EE	PB	PB	PB	PB
PB/EE	EE	EE	PB	EE	EE	PB	EE	EE	EE

While the REC button is pressed in the play, search, fast forward or rewind mode, the E-to-E mode picture and audio can be monitored. While the EDIT button is pressed, the E-to-E mode picture and audio selected by the ASSEMBLE or INSERT buttons can be monitored. When the button is released, the unit will set to the prior condition.

In the stop mode, the E-to-E mode picture and audio are kept monitored when the REC or EDIT button is pressed and released. Press the STOP button to set the unit into the prior condition or press the proper button to set the unit into another mode.

## MODE SELECT SWITCH AND SERVO LOCK SELECTOR

These switches select the video signal from the VIDEO IN or DUB IN connector, the external signal from EXT SYNC IN connector or the internal sync signal as the reference signal for servo lock.

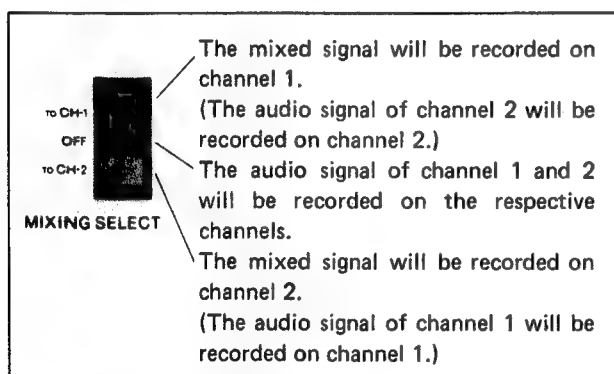
SERVO LOCK selector position		AUTO			EXT SYNC	
VTR operating mode		Recording	Playback, E-E		Recording	Playback, E-E
MODE SELECT switch position		EDIT, NORMAL, TBC	EDIT	NORMAL TBC	EDIT, NORMAL, TBC	
Input signal to VIDEO IN or DUB IN	EXT SYNC IN					
Yes	Yes	VIDEO	VIDEO (EXT SYNC IN)	EXT SYNC IN (VIDEO)*	EXT SYNC IN	
Yes	No	VIDEO	VIDEO (Internal sync signal)		VIDEO	VIDEO (Internal sync signal)
No	Yes		EXT SYNC IN			
No	No		Internal sync signal			

When the player is in the mode other than playback during editing using the BVE-500, BVE-500A, BVE-800, two BVU-820 or a BVU-800 and a BVU-820, the recorder's servo reference signal is as indicated in parentheses.

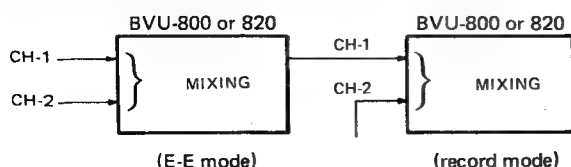
\* When one of the ASSEMBLE or INSERT buttons is pressed (the button is lit), and the VTR is in the PLAY mode or the EDIT button is lit, the recorder's reference signal will be VIDEO.

## MIXING THE AUDIO SIGNALS

The audio signals of channel 1 and channel 2 can be mixed during recording. It is also possible to record the mixed signal on either channel 1 or channel 2 by setting the MIXING SELECT switch as follows:



- The mixed audio input signals of channels 1 and 2 will be mixed recorded at the same level.
- When two BVU-820s or a BVU-800 and a BVU-820 are connected, three of audio signals can be mixed.



## TAPE PROTECTION

If the unit stays in the stop mode for more than 8 minutes, the unit will automatically turn off the standby mode (the drum stops rotating) to protect the tape and the video heads. If the tape is stopped in the search mode for more than 8 minutes, the tape will advance in forward direction at the 1/30 normal speed. To set the unit into the desired mode (except the stop mode) press the appropriate button. To set the unit into the stop mode, press the STANDBY button.

## MOISTURE CONDENSATION

If the moisture is condensed, the drum and the capstan motors stop and the cassette will be ejected. The AUTO OFF lamp on the front panel will light. Then the drum will begin rotating again. To operate the machine, wait until the AUTO OFF lamp will go off and about ten minutes will have passed.

- When a BVR series equipment is connected, the period of 10 minutes should be set on the equipment to enter the tape protection mode. For details, refer to the instruction manual furnished with the equipment.

## TIME CODE RECORDING

For simultaneous recording of time code, connect an SMPTE time code generator to the TIME CODE IN connector.

No adjustment is necessary, as the time code is recorded with the limiter.

During recording, the TIME CODE lamp lights.

## 1.5. PLAYBACK

### 1. PREPARATION

Set the controls as follows.

**SERVO LOCK:**

AUTO:

Normal position

EXT SYNC:

For external sync

(See page 1-16.)

**FRAMING SERVO: ON**

to monitor

Video output

Audio output

Rear panel

For connections, see page 1-55.

AC power

Insert a recorded video cassette.

**TRACKING: FIXED**

**POWER: ON**

**AUDIO MONITOR:**

MIX, normally

**REMOTE/LOCAL:**  
LOCAL

**DT SELECT: OFF**

**SKEW: FIXED**

Front panel

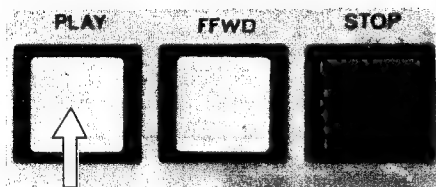
**MODE SELECT: NORMAL, normally**

**PB/PB/EE: PB, normally**

**INPUT SELECT:**

When the video input signal is selected as a reference signal, set this switch to the position which indicates where the signal is connected.

## 2. TO START PLAYBACK



Press the **PLAY** button.

It will take several seconds for the drum and the capstan servo to lock. The servo lamp will light when the servo is locked.

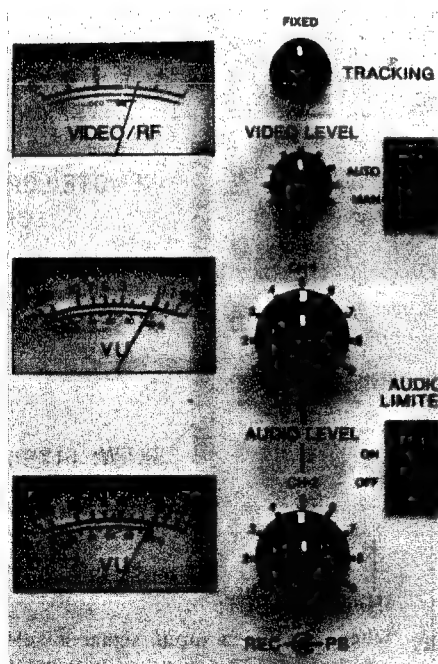
The lamps lit: **PLAY, STANDBY**

To stop playback, press the **STOP** button.

The lamps lit: **STOP, STANDBY**

If the tape reaches the end, it will automatically rewind to the beginning and stop.

## 3. ADJUSTMENTS



### TRACKING AND SKEW ADJUSTMENTS

Normally, set these controls at the **FIXED** position.

**If a noise appears on the playback picture,**

Turn the **TRACKING** control to left or right so that the pointer of the **VIDEO/RF** meter points as far to the right as possible.

- Be sure to set the **DT SELECT** switch to **OFF** during adjusting the tracking.
- When the playback of the particular tape is finished, return the control to the **FIXED** position.

**If the top of the picture is distorted,**

Turn the **SKEW** control to the position which gives the best possible picture.

### VIDEO AND AUDIO LEVEL ADJUSTMENTS

**Video level**

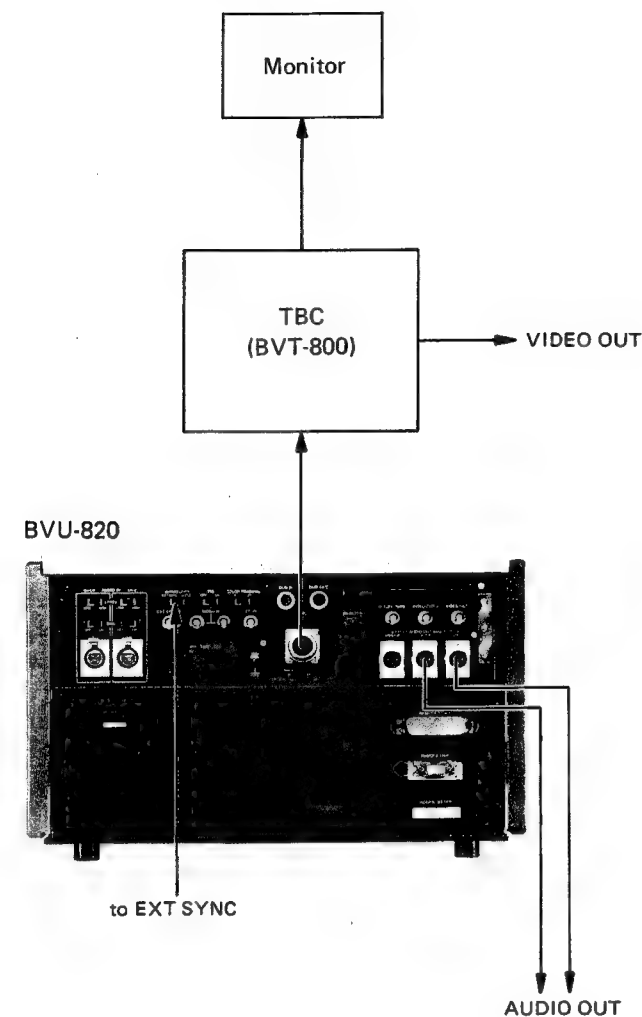
The video level is adjusted automatically.

**Audio level**

During playback, adjust the **AUDIO LEVEL** controls for channels 1 and 2 so that the **AUDIO LEVEL** meters read approximately zero at the maximum deflection.



## PLAYBACK WITH A TIME BASE CORRECTOR



Set the MODE SELECT switch on the front panel to TBC.

To use the time base corrector other than a BVT-800, refer to the instruction manual furnished with the time base corrector.

### TO MONITOR VIDEO AND AUDIO SIGNALS

See page 1-15.

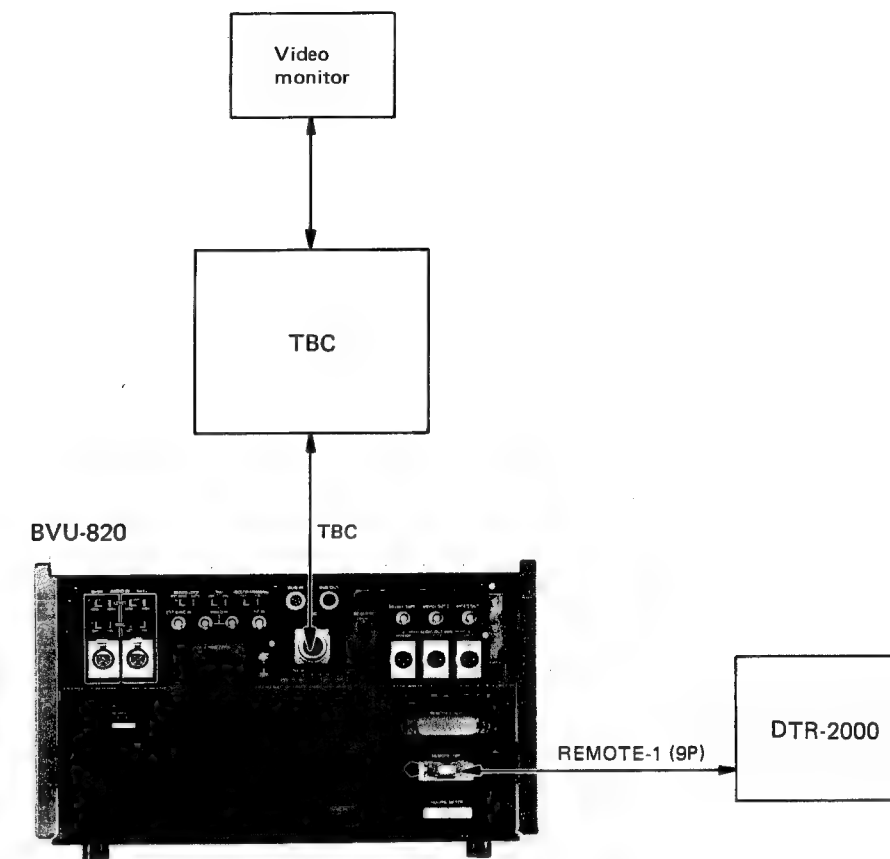
### AUTOMATIC RELEASE

See page 1-16.

### TIME CODE PLAYBACK

For reading out the time code, connect an SMPTE time code reader to the TIME CODE OUT connector. During playback, the TIME CODE lamp lights.

## PLAYBACK WITH A DTR-2000



The following operation will be possible when the DTR-2000 dynamic control unit is used together.

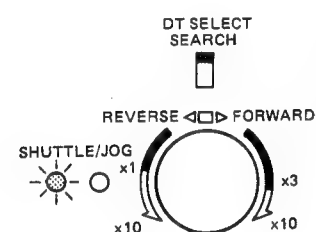
- Up to five cue points can be memorized. The memory of more 150 cue points will be possible if an optional key board is installed.
- The data of the cue points can be kept by recording it on the audio track of the tape or by using the teletypewriter.
- Any cue point will be automatically searched for.
- The playback program at various kinds of speed up to 30 seconds can be memorized and be played back repeatedly.

## DYNAMIC TRACKING PLAYBACK

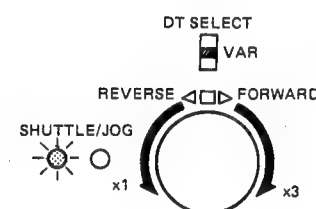
When the DT SELECT switch is set to SEARCH or VAR, the playback picture at  $-1$  to  $+3$  times normal speed can be seen without any guard band noise. This is called dynamic tracking playback.

- For dynamic tracking playback, be sure to use a time base corrector together, or the jitter or the picture distortion may occur.
- When the power is turned on or when the inserted cassette is changed, play the tape back in the normal playback mode for 8 seconds or more, then start dynamic tracking playback.

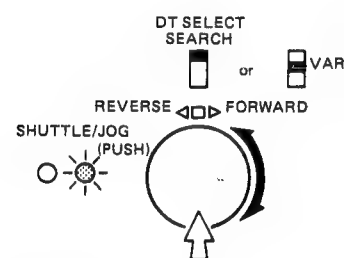
Set the DT SELECT switch to SEARCH or VAR and press the PLAY button. The normal speed dynamic tracking playback will begin. When the search dial is used, the following speed can be obtained.



The playback speed is varied from  $-10$  to  $+10$  times normal, but the dynamic tracking playback is possible within the range of  $-1$  to  $+3$  times normal speed.



When the dial is turned fully counterclockwise, the playback speed will be  $-1$  time normal, and at the fully clockwise position, the playback speed will be  $+3$  times normal. At any position, dynamic tracking playback picture is obtained.



When the search dial is pressed, the VTR is in the JOG mode and the dynamic tracking playback is performed at the speed of rotation. When the dial stops, a noiseless still picture is displayed.

■ : Dynamic tracking playback

### Notes:

- The picture quality played back with the R/P head is better than that with the DT head so that we recommend to play the tape back with the R/P head for duplicating tape or editing.
- To duplicate the dynamic tracking playback picture, the better results will be obtained when the signals are connected using the VIDEO OUT connector instead of the DUB OUT connector.

## Automatic change of head

### When the BVU-820 is used as a player

Even if the DT SELECT switch is set to SEARCH or VAR, the playback head is automatically changed from the DT head to the R/P head during preroll when the PREVIEW or AUTO EDIT button is pressed. Therefore the picture played back with the R/P head is fed from the player to the recorder during auto-editing independent of the DT SELECT switch setting. When the editing is finished, the DT head is automatically activated.

### Note:

The automatic change of playback head functions only when the BVU-820, BVU-800 or BVE-800 is connected to the REMOTE-1 (9P) connector. If the REMOTE-2 (36P) connector is used or the other equipment is connected to the REMOTE-1 (9P) connector or the player is in the manual editing mode, this function does not operate. In this case, be sure to set the DT SELECT switch to OFF to perform editing.

### When the BVU-820 is used as a recorder

When the REC and PLAY buttons are pressed, or when the one of the ASSEMBLE or INSERT buttons is pressed, the R/P head is automatically activated even if the DT SELECT switch is set to SEARCH or VAR. However, when the search dial is turned after one of the ASSEMBLE or INSERT buttons is pressed with the DT SELECT switch set to SEARCH or VAR, the DT head is activated and a noiseless playback picture can be seen. Pressing the PREVIEW, AUTO EDIT or PLAY button reactivates the R/P head. This function is operative with the control panel of the BVU-820 or with the equipment connected to the REMOTE-1 (9P) connector or the REMOTE-2 (36P) connector.

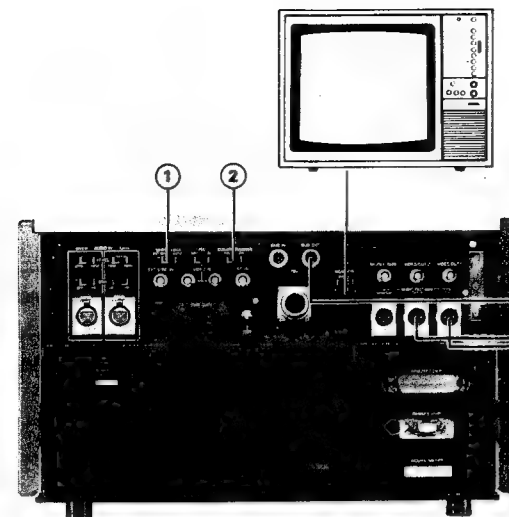
## 1-6. EDITING

### 1-6-1. Editing with Two BVU-820 Video Cassette Recorders

#### 1. PREPARATIONS

##### PLAYER

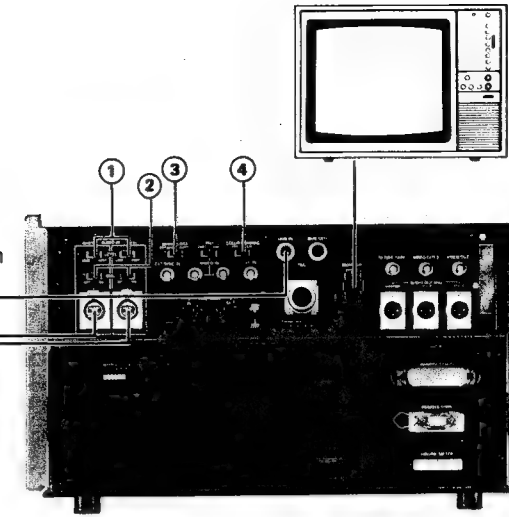
- ① SERVO LOCK:  
AUTO: Normal position  
EXT SYNC: For external sync.
- ② FRAMING: ON



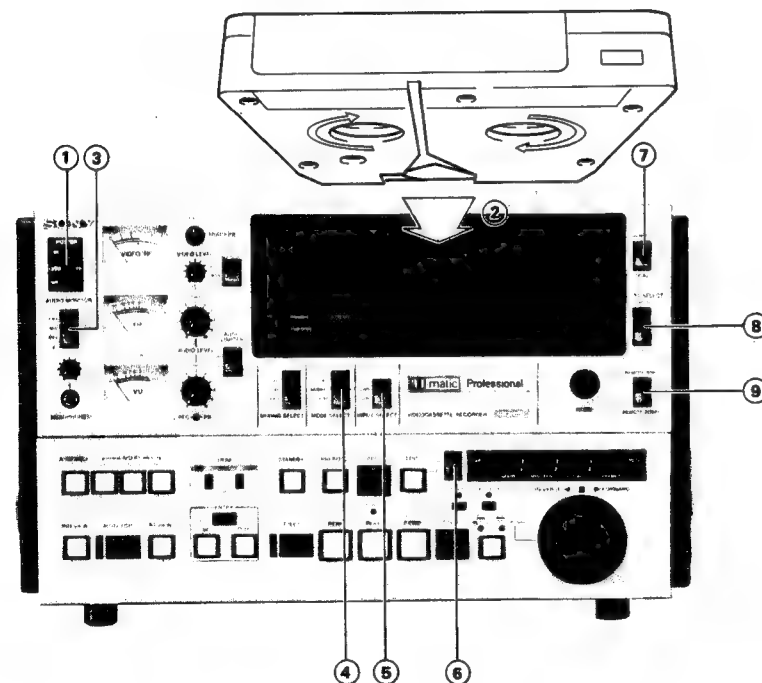
For connection, see the illustration in "CONNECTIONS".

##### RECORDER

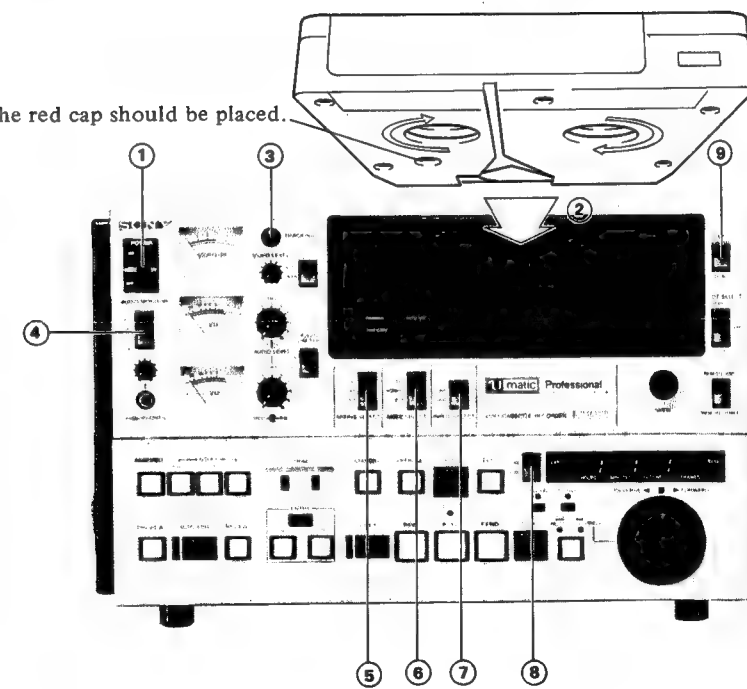
- ① AUDIO IN LEVEL: HIGH
- ② 600  $\Omega$ : ON
- ③ SERVO LOCK:  
AUTO: Normal position  
EXT SYNC: For external sync.
- ④ FRAMING SERVO: ON  
When recording the signal with no framing, set this switch to OFF.



- ① POWER: ON
- ② Insert a recorded video cassette
- ③ AUDIO MONITOR: MIX
- ④ MODE SELECT: EDIT
- ⑤ INPUT SELECT:  
When the video input signal is selected as a reference signal, set this switch to the position which indicates where the signal is connected.
- ⑥ PB/PB/EE: PB
- ⑦ REMOTE/LOCAL: REMOTE
- ⑧ DT SELECT: OFF
- ⑨ REMOTE-1/REMOTE-2: REMOTE-1  
Adjust the video and audio levels, tracking and skew as shown on page 1-18.

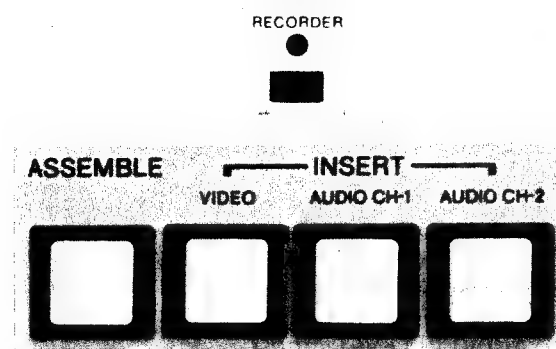


The red cap should be placed.



- ① POWER: ON
- ② Insert a cassette to be edit recorded.
- ③ TRACKING: FIXED
- ④ AUDIO MONITOR: MIX
- ⑤ MIXING SELECT: OFF
- ⑥ MODE SELECT: EDIT
- ⑦ INPUT SELECT: DUB  
When the VIDEO IN connector is used for the video signal from the player, set to LINE.
- ⑧ PB/PB/EE: PB/EE
- ⑨ REMOTE/LOCAL: LOCAL  
Adjust the video and audio levels as shown on page 1-14.

## 2. SELECT THE EDITING MODE



### ASSEMBLY EDITING

- 1 Press the RECORDER button on the recorder. The RECORDER lamp will light.
- 2 Press the ASSEMBLE button on the recorder.

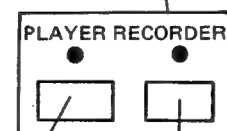
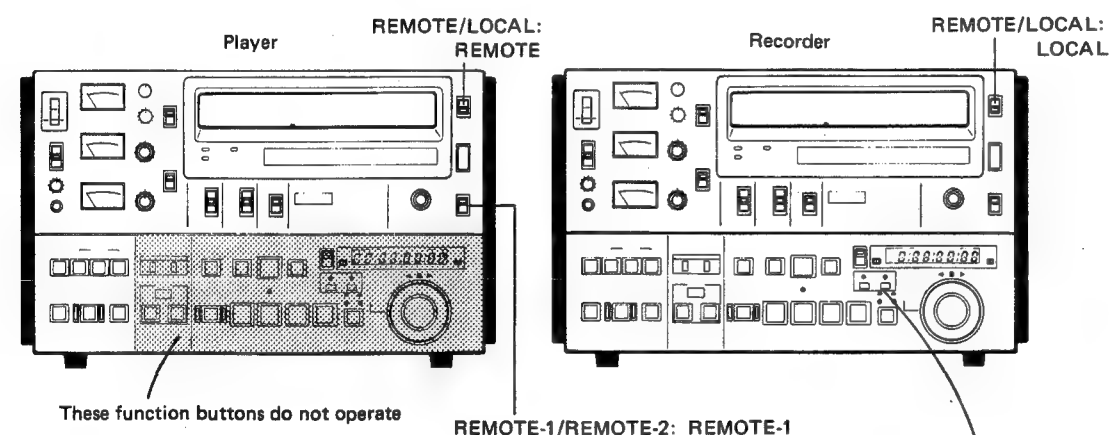
### INSERT EDITING

- 1 Press RECORDER button on the recorder. The RECORDER lamp will light.
- 2 Select the desired input signal with any or all of the INSERT buttons on the recorder. The signal is disconnected, when a button is pressed again.

### IMPORTANT

When editing with two BVU-820, or a BVU-800 and a BVU-820 video cassette recorders, the recorder front panel controls the recorder itself and plus, it remotely controls the standby, preroll, eject, fast forward, play, rewind, stop, search (jog and shuttle), entry in/out, trim, reset and time counter functions on the player.

On the subsequent pages, the edit operating procedure using only the front panel of the recorder is explained. The player is remotely controlled.



Press this button to use the function buttons for remote control of the player. The function lamps, search lamp and servo lamp will light as on the player.

Press this button to use the function buttons for the recorder itself.

- In case machine does not follow the functional command after pressing the function key, turn the POWER switch off to reset the machine and then turn it on to make sure that the machine operates properly.
- If you set the REMOTE/LOCAL selectors on both the recorder and player to LOCAL, the function buttons on both machines will control only those machines. In this case, the PREVIEW, AUTO EDIT and REVIEW buttons have to be used on the recorder.

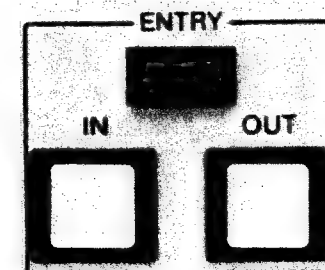
## 3. DETERMINE THE EDIT-IN POINT AND EDIT-OUT POINT

The selected signals between the edit-in and edit-out points will be edited on the desired part of the tape on the recorder.

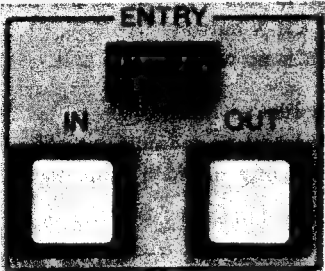
The edit operating procedure using only the front panel of the recorder is explained. The player is remotely controlled.

### EDIT-IN POINT FOR THE PLAYER

1 Press the PLAYER button.	<p>The PLAYER lamp lights.</p>
2 The SHUTTLE and JOG lamps to the left of the Search dial indicate whether the Search dial is in the shuttle or jog mode. Push the Search dial in so that the SHUTTLE indicator lights.	
3 Turn the Search dial to control the tape speed.	<p>The tape speed can be varied between 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 10 times normal speed in either direction. The IN and OUT lamps blink.</p> <ul style="list-style-type: none"> <li>• To see a noiseless picture, set the DT SELECT switch to SEARCH or VAR. (For details, see "Dynamic-tracking playback" on page 1-21.)</li> <li>• When the dial is turned to the position at which a click is felt, the machine enters into the fast forward mode (x10). When the machine enters into the fast forward mode, the picture is stopped or distorted for a moment.</li> </ul>
4 Approximately locate the beginning of the scene to be recorded by viewing the monitor connected to the player. At this point, press the Search dial in.	<p>The still picture of this point will be displayed. The dial remains in the depressed position and the player is set in the JOG mode. The JOG lamp lights.</p>
5 Rotate the Search dial to the right or left in the JOG mode until the desired edit-in point is displayed on the monitor.	<p>The direction and speed of the tape in the jog mode depend on how rapidly clockwise or counterclockwise the Search dial is rotated. When you stop rotating the dial, you obtain a still picture again.</p>
6 Press the IN and ENTRY buttons simultaneously.	<p>The counter number at this point is memorized as the edit-in point. The IN lamp lights. The first edit-in point should be at least 5 seconds after the beginning of the tape (or at least 7 seconds after the beginning of the tape when the preroll time switch is set to OFF).</p> <p>To enter a different edit-in point, locate the new edit-in point and again press the IN and ENTRY buttons simultaneously.</p> <p>The edit-in point can be entered not only in the stop and still modes but also in the play, search, fast forward and rewind modes.</p>




## EDIT-OUT POINT FOR THE PLAYER

<p>① Locate the desired edit-out point in the same way as you located the edit-in point.</p>	<p>(Steps ① through ⑤ on the previous page.)</p>
<p>② Press the OUT and ENTRY buttons simultaneously.</p> 	<p>The OUT lamp lights.</p> <p>The counter number at this point will be memorized as the edit-out point.</p> <ul style="list-style-type: none"> <li>• If the same point is entered as the edit-in and the edit-out points or if the edit-out point is entered before the edit-in point, the edit-in point will be cleared. Enter the edit-in and edit-out points correctly.</li> </ul>

- The edit-out point should be entered into either the player or the recorder.

## EDIT-IN POINT FOR THE RECORDER

<p>① Press the RECORDER button.</p> 	<p>The RECORDER lamp will light.</p>
<p>② Locate the point on the tape from which the scene is to be recorded in the same way as you searched for the edit-in point on the player.</p>	<p>The IN lamp blinks.</p>
<p>③ Press the IN and ENTRY buttons simultaneously.</p>	<p>The IN lamp lights.</p> <p>The counter number at this point will be memorized as the edit-in point.</p> <p>The first edit-in point should be at least 5 seconds after the beginning of the tape (or at least 7 seconds after the beginning of the tape when the preroll time switch is set to OFF.)</p>

## EDIT-OUT POINT FOR THE RECORDER

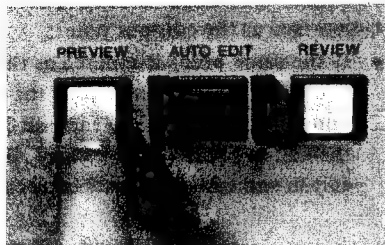
If the edit-out point is to be entered into the recorder, proceed as follows:

- 1) Locate the point where recording is to end in the same way as you searched for the edit-in point on the player.
- 2) Press the OUT and ENTRY buttons simultaneously.

The counter number at this point will be memorized as the edit-out point.

#### 4. TO REHEARSE EDITING: THE PREVIEW MODE

Once the edit-in and edit-out points have been set, you can rehearse the scene by pressing the PREVIEW button.



- ① After the edit-in and edit-out points have been set, press the PREVIEW button. The PREVIEW lamp will light.
- ② Watch the recorder's monitor. Check that the edit-in and edit-out points are correct and that the quality of the picture to be recorded is satisfactory.
- ③ If necessary, re-enter the edit-in and edit-out points and rehearse the scene again by pressing the PREVIEW button.

To stop the tape during previewing, press the STOP button. If you want to start auto edit recording during previewing, press the AUTO EDIT button.

#### 5. TO BEGIN EDIT RECORDING

Press the AUTO EDIT button.

The recording will automatically proceed.



- You can start automatic edit-recording during previewing or skipping previewing.

### When the edit recording is finished

When the recording of one scene (from the edit-in to the edit-out point) is finished, search for and enter the edit-in and edit-out points for the next scene, as described on the previous pages. You can also make the edit-out point of one scene as the next edit-in point for the recorder. For details, see page 1-37.

### To monitor the edit recording

You can monitor the recording from 5 seconds (or 7 seconds) prior to the edit-in point to 2 seconds after the edit-out point on a video monitor connected to the recorder.

When the PB/PB/EE selector is set to PB during edit-recording, the simultaneous playback picture can be monitored.

In the insert edit mode, if the tape on the recorder is missing some CTL signals or has a part the servo is unlocked, the playback picture of the tape on the recorder will appear on the monitor and the edit recording is not made during that portion.

### To stop the edit recording

To stop recording before the edit-out point, press the OUT and ENTRY buttons simultaneously.

### Tape protection

If the unit stays in the search still mode for more than 8 minutes, the tape will move in the 1/30 normal speed in forward direction to protect the tape and the video heads, keeping the precise edit-in point.

### To change the preroll time

The preroll time can be changed, if necessary, to 7 seconds. The preroll time set on the recorder will be selected for both the player and recorder. For details, see section 2.

### To change the sharpness of the picture to be recorded

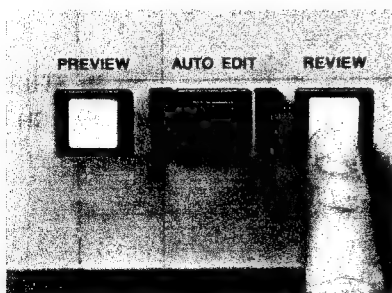
The sharpness of the picture can be changed using the SOFT/SHARPNESS switch. For details, see section 2.

### To adjust the edit accuracy

The edit accuracy is preset within  $\pm 1$  frame at the factory. If any adjustment is necessary, see section 2 and the following sections.

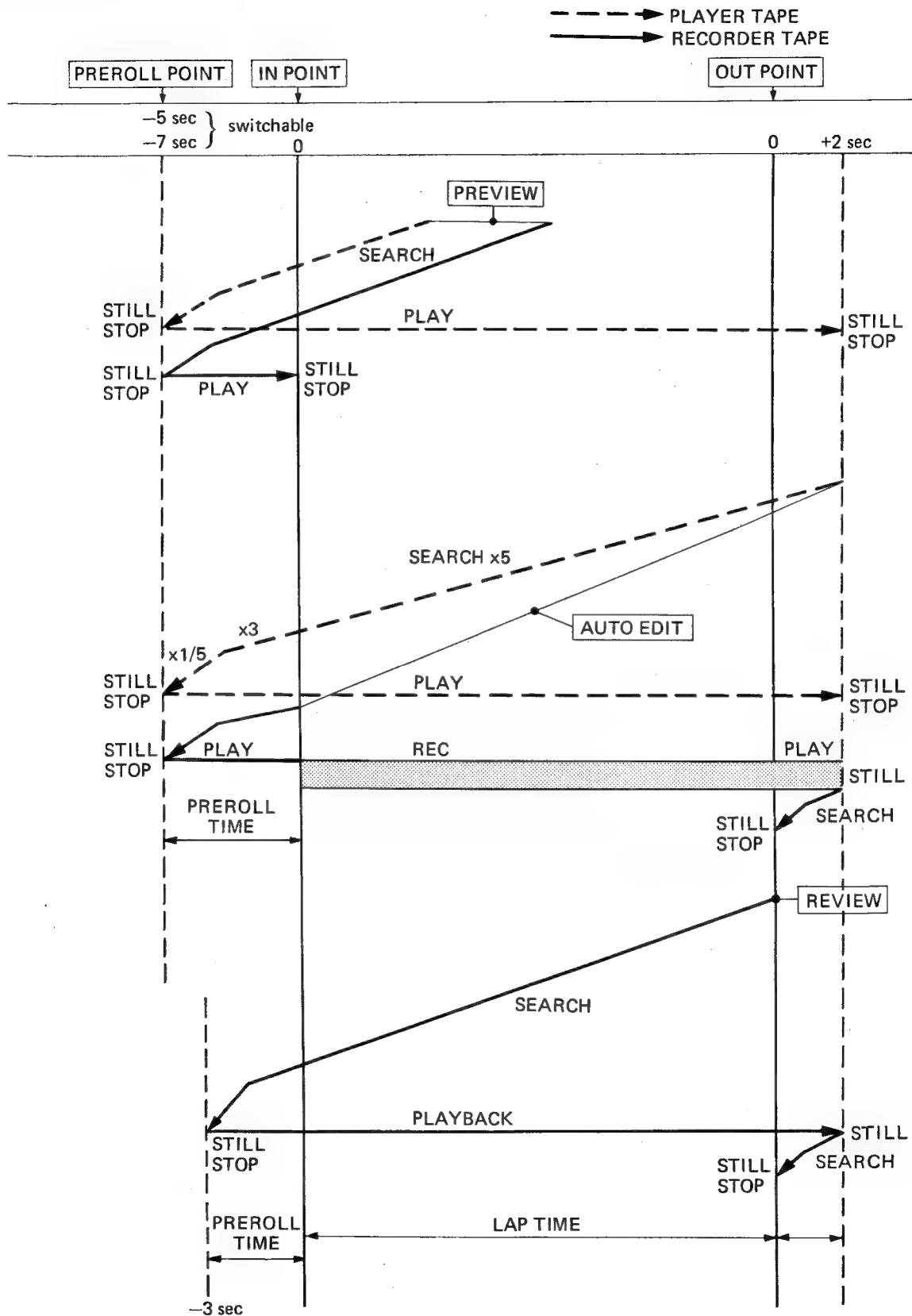
## 6. TO CHECK THE RECORDING: THE REVIEW MODE

When a scene has been recorded from the edit-in point to the edit-out point, you can check the result by pressing the REVIEW button.



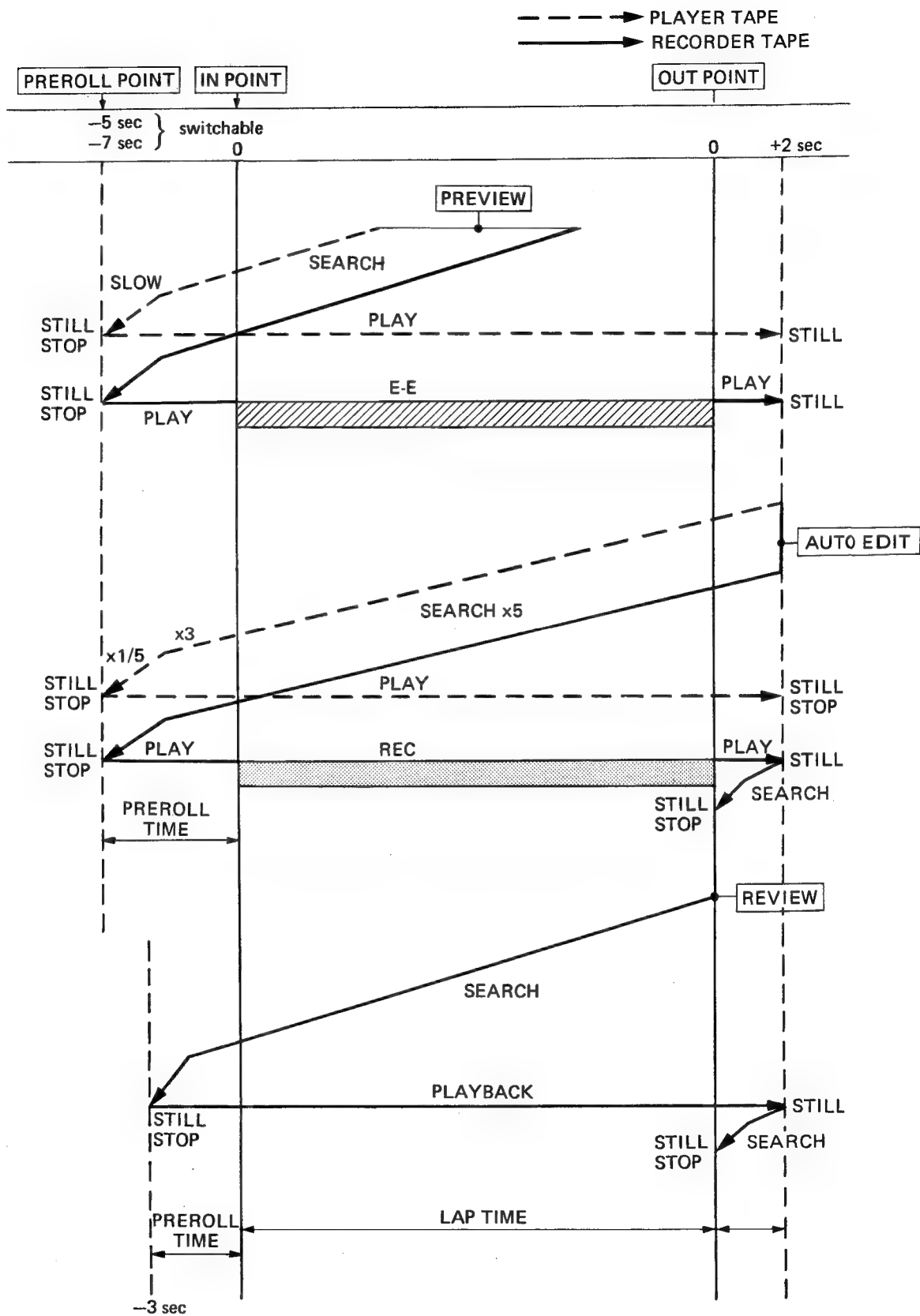
- ① Press the REVIEW button after the recording has been made.  
The REVIEW lamp will light.  
The tape on the recorder only will move.
- ② Watch the recorder's monitor to check the quality of the recording.  
To stop the tape during reviewing, press the STOP button.

# TAPE MOTION ASSEMBLE MODE





# INSERT MODE



## TIME COUNTER (TAPE TIMER)



The time counter counts the CTL signals on the tape and the displayed figures indicate how much the tape has advanced at normal speed in hours, minutes, seconds and frames. The number changes as the tape moves.

- Counter will not count the time since there is no CTL signal. Therefore, the count display using a non-recorded tape is erroneous.
- When the BK-806 time code generator/reader (optional) is used, the time code is also counted.

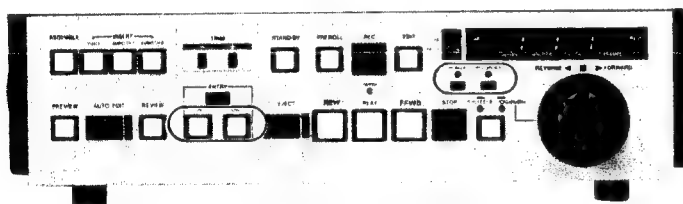
To set the time counter to "0:00:00:00"

Press the RESET button.

- When the tape runs in reverse from "0:00:00:00", a minus sign "-" will be displayed to the left of the figures.
- You will find that indexing the contents of your tapes by the figures on the time counter will make searching for editing points much easier.

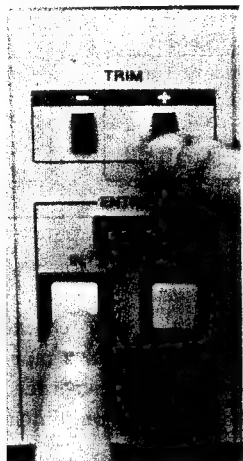
## To check the edit-in and edit-out points by the time counter

Press the IN or OUT button for the player (Press the **PLAYER** button.) or for the recorder (Press the **RECORDER** button.) and hold it down.



While the button is pressed, the figures of the edit-in or the edit-out point of the player or of the recorder will be displayed.

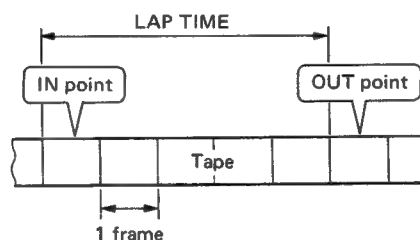
# The TRIM mode: fine adjustment of the editing points using the time counter



- ① Press the IN or OUT button and hold it down through step ②.  
The frame number of the edit-in or edit-out point will be displayed.
- ② Press and release the TRIM + button to advance the editing point one frame or press and release the TRIM – button to set the point back one frame.  
The frame number displayed will change accordingly.  
Repeat pressing and releasing the + or – button until you achieve the desired frame number.

You may also change the edit point by entering another point.

When the lap button is pressed

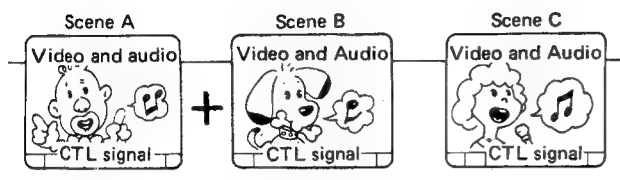


The lap time will be indicated by the time counter.

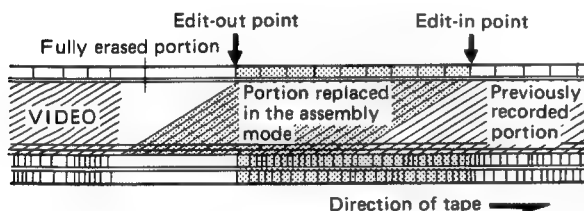
Editing points entered	The figures displayed indicate
The edit-in and edit-out points have been entered.	The duration of the edit-in and edit-out points.
Only the edit-in point has been entered.	The duration of the edit-in point and the point where the button is pressed.
Only the edit-out point has been entered.	The duration of the previously edited scene.
The edit-in and edit-out points have not been entered.	The duration of the previously edited scene.

## ASSEMBLY EDITING

In the assembly edit mode, all the signals — video, audio channel 1 and channel 2 and CTL signals — are recorded on the tape simultaneously. First record the video, audio and CTL signals of scene A and then record the video, audio and CTL signals of scene B, scene C, scene D and so on.



The assembly edit mode is used on a non-recorded tape where the video and audios are recorded simultaneously. The recordings are made back to back. If the new material is edited on a previously recorded tape in the assembly mode, the fully erased portion will be produced on the tape after the edit-out point and the picture will be unstable at that point. To add a new material on a previously recorded tape, edit in the insert edit mode.

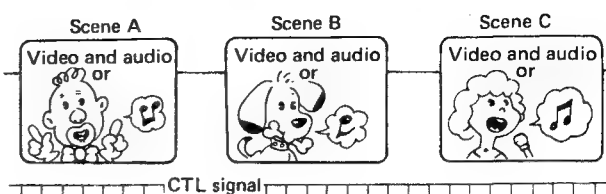


## TO RECORD ON A NEW TAPE IN THE ASSEMBLY MODE

It is not necessary to record the CTL signal in advance, but if the assembly edit is to be made from the beginning to the new tape or after a blank on the tape, a CTL signal has to be recorded for at least 5 seconds (7 seconds, if the preroll time switch is at the OFF position) prior to the first edit-in point. Instead of recording a CTL signal, you may simply duplicate the tape in the record mode.

## INSERT EDITING

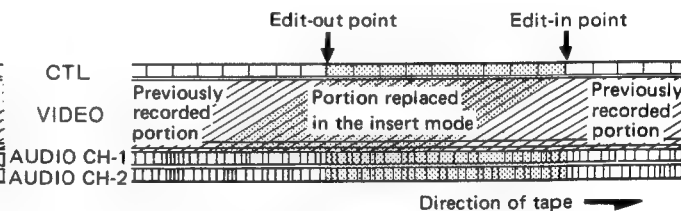
In the insert edit mode, the CTL signal should have already been recorded. New video and/or audio signals are added keyed to this CTL signal.



The insert edit mode is the mode to use when you want—

- to perform accurate edits on a pre-recorded tape.
- to add music and/or narration to a tape on which the video signal has been already recorded.
- to add video signal to a tape on which an audio signal has been already recorded.
- to replace the video and/or audio signals of a tape which has been edited in the assembly mode.

In the insert edit mode, a new scene can be inserted into a previously recorded tape. The picture will be stable at the edit-out point.



## TO RECORD ON A NEW TAPE IN THE INSERT MODE

The CTL signal should be recorded continuously in the portion to be recorded and for at least 5 seconds (7 seconds, if the preroll time switch is at the OFF position) prior to and after that portion.

To record the CTL signal:

- Connect a video camera and continuously record its output signal.
- Connect a standard video signal generator and continuously record its output signal.

## BLINK OF THE LAMPS

Operate the buttons above which the lamps are blinking, and the editing can be completed. The blinking and lighting of lamps are as follows.

- The ASSEMBLE and INSERT (VIDEO, AUDIO CH1, AUDIO CH2) lamps blink indicating that the editing mode is to be determined by pressing the appropriate button.

One or more lamps light indicating that the editing mode has been determined.

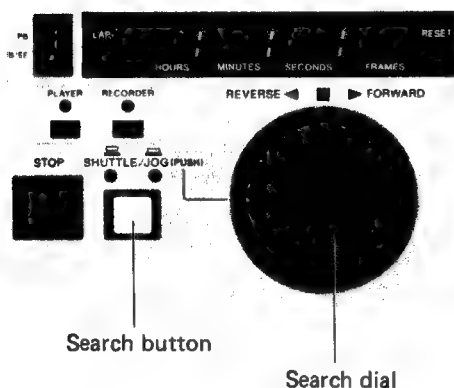
- The IN and/or OUT lamp(s) for the player and recorder blink indicating that the editing point(s) must be entered.

The IN and OUT lamps light when the edit-in and edit-out points have been entered but the editing has not been performed.

- The PREVIEW and AUTO EDIT lamps blink indicating that you can proceed either the preview or auto edit operation.

The PREVIEW or AUTO EDIT lamp lights to indicate that the recorder is in one of these modes.

## HOW TO USE THE SEARCH BUTTON



**Use 1:** to enter the unit directly into the shuttle mode at the speed set on the Search dial.

- 1 Set the Search dial to the desired position to the position for 5 times normal forward speed, for example, in the shuttle mode.
- 2 Press the PLAY button.  
The recorder will enter the playback mode.
- 3 Press the Search button.  
The machine will enter directly into the shuttle mode at 5 times normal forward speed.

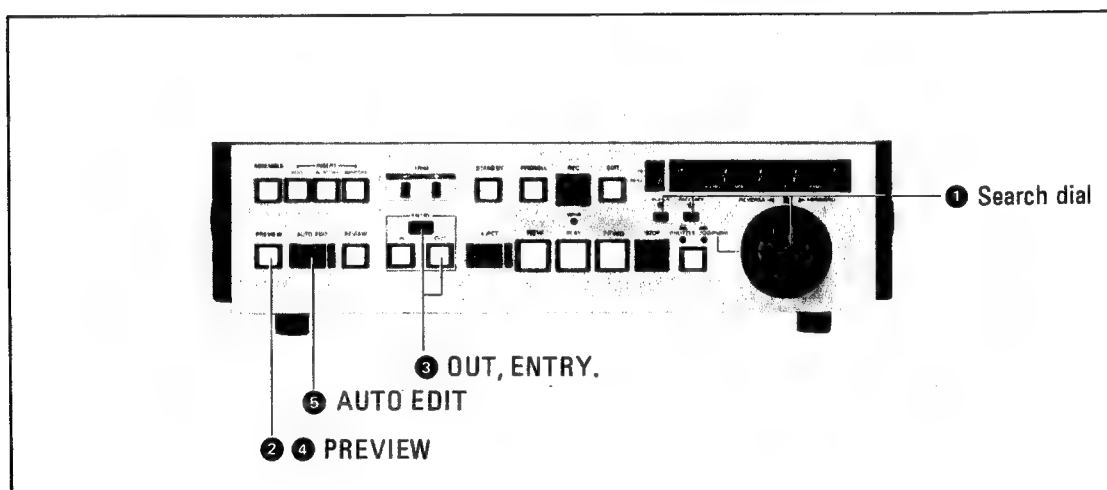
**Use 2:** to prevent accidental entry into the search mode

While operating this unit, if the Search dial is touched, the machine will enter the search mode. To prevent this, set the switch S4 on the SY-37 board to OFF. Now the Search dial will not operate until the Search button is pressed. For details, see section 2.

## QUICK EDITING

You can save time by entering the edit-in and edit-out points in the preview mode.

- ① Locate the desired edit-in points for the player and the recorder by using the Search dial. Obtain a still picture.
- ② Press the PREVIEW button.  
The points obtained in the step ① will be memorized as the edit-in points for the player and recorder. The preview will start.  
The IN lamps will light.
- ③ Watch the recorder's monitor and at the point where the scene is to end, press the OUT and ENTRY buttons simultaneously on the player or the recorder.  
The counter number will be memorized as the edit-out point.  
The tape will run for 2 more seconds as a post roll and return to the preroll point.
  - You may also use the Search dial to locate the desired point where the scene should end.
- ④ If necessary, preview the tape again.
- ⑤ Press the AUTO EDIT button.  
The edit recording will be made.



## To edit even more quickly

You can edit by skipping the entry procedures.

- ① Locate the edit-in points on the player and the recorder using the Search dial. Obtain a still picture.
- ② Press the AUTO EDIT button.  
Recording will be made from that point which will be the edit-in points on the player and recorder.
- ③ Watch the recorder's monitor and at the point where the scene is to end, press the OUT and ENTRY buttons simultaneously on the recorder or the player.  
The recording will stop at this point, which will be the edit-out point.

## CONTINUOUS EDITING: THE BUTT EDIT

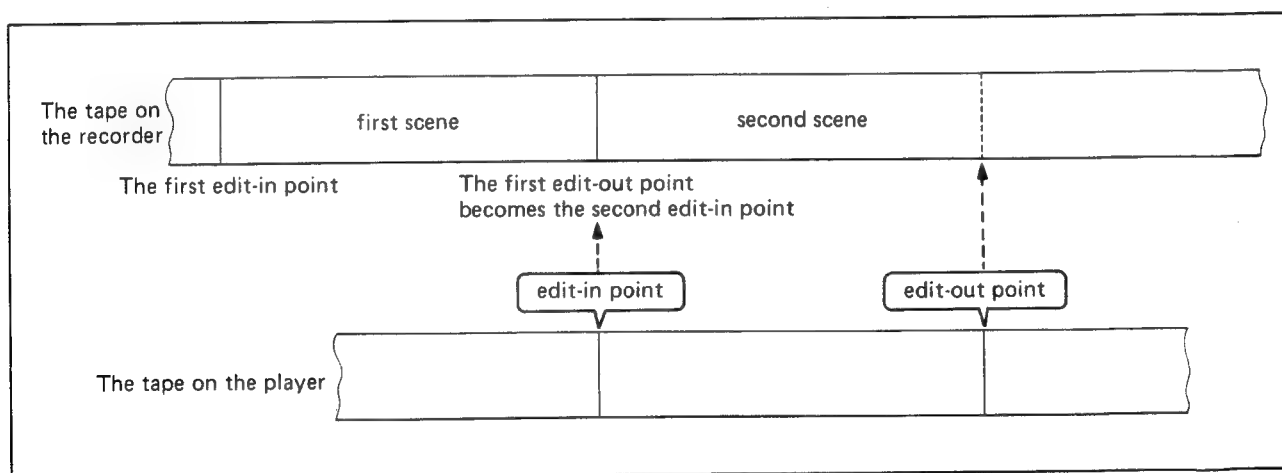
When you have finished recording from edit-in point to edit-out point, the recorder returns to the edit-out point and stops. You can make this edit-out point as the next edit-in point for the recorder.

This technique is called "Butt edit".

- ① Locate the desired positions and enter the next edit-in and edit-out points for the player.
- ② Press the AUTO EDIT button.  
The recording will be performed.

Or you may proceed as follows:

- ① Locate the desired position and enter the next edit-in point for the player.
- ② Press the AUTO EDIT button.  
The recording will start.
- ③ Watch the recorder's monitor and at the point where the scene is to end, press the OUT and ENTRY buttons simultaneously on the recorder or player.  
The recording will stop at this point, which will be the edit-out point.



**THE SPLIT EDIT: TO SET DIFFERENT EDIT-IN OR EDIT-OUT POINT FOR VIDEO AND AUDIO**

In the insert edit mode, you can stop the edit-recording of the video and audio channel 1 and audio channel 2 separately.

- ❶ Select the desired input signal with any or all of the INSERT buttons.
- ❷ Start automatic edit-recording.
- ❸ At the point where the edit-recording of the video or audio is to stop, press the appropriate INSERT button(s).  
The corresponding light(s) will turn off.  
At the point where the edit-recording of the video or audio is to begin, press the appropriate INSERT button(s).  
The corresponding light(s) will turn on.  
You may cut in or cut out the desired signal(s) at any point by pressing the INSERT button(s). Even if all the signals are cut out, the desired signal(s) can be cut in simply by pressing the INSERT button(s).
- ❹ When the edit-out point has been entered, the recording will stop automatically.  
When the edit-out point has not been entered, press the ENTRY and OUT buttons to stop edit-recording.  
Once you stop edit-recording, the video or audio signals cannot be cut in by simply pressing the INSERT buttons.

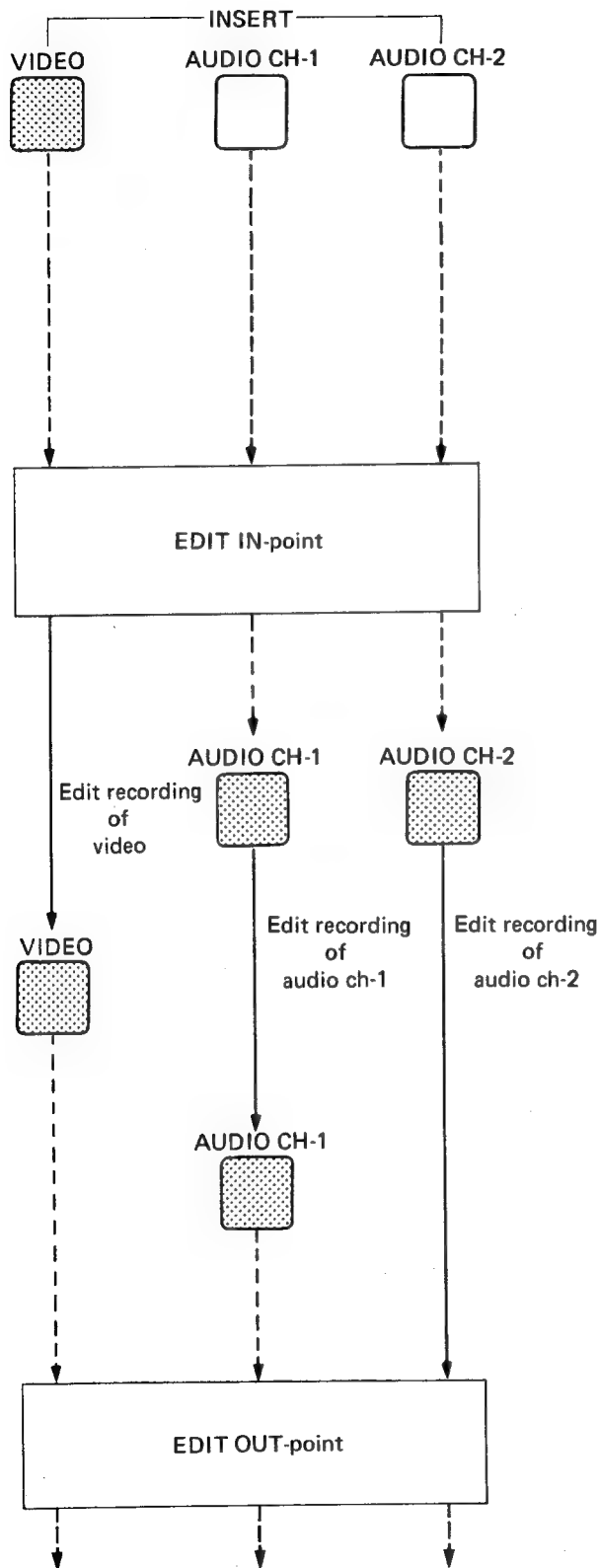
Or in the manual insert edit mode, you can split-edit in the same way. To stop edit-recording, press the PLAY button.



# Example of the split edit



The buttons to be pressed



The video signal is selected for the input signal.

Edit recording of video signal starts by pressing the AUTO EDIT button.

Edit recording of audio ch-1 and ch-2 signal starts.

Recording of the video signal ends.

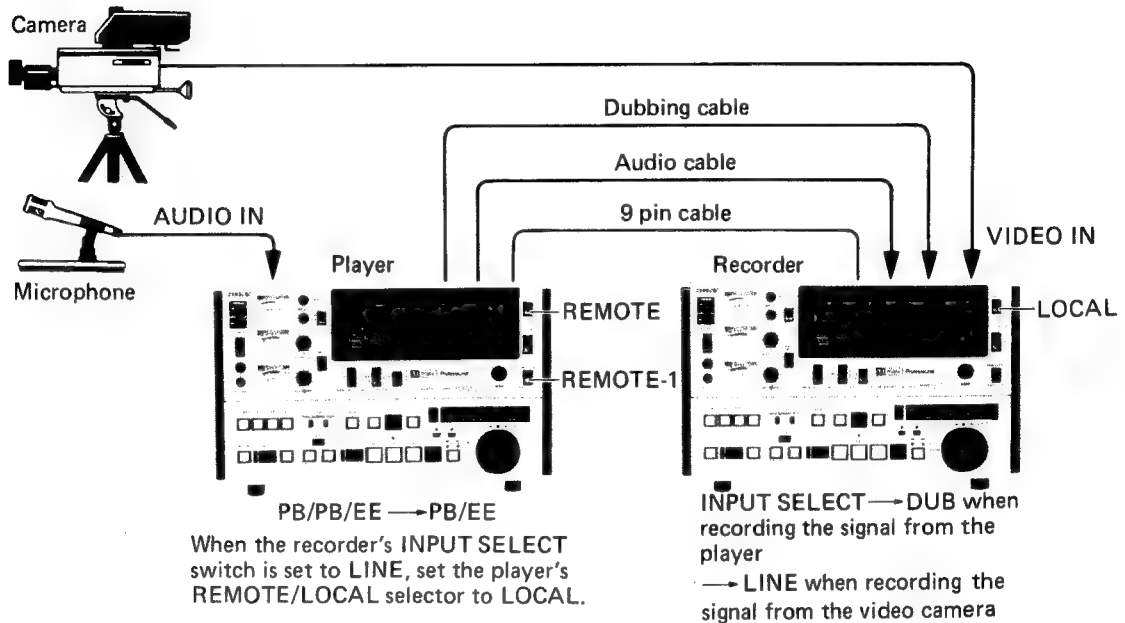
Recording of the audio ch-1 signal ends.

Edit-recording ends.

## EDITING THE SIGNAL FROM A VIDEO CAMERA: THE LIVE EDIT

### Connections

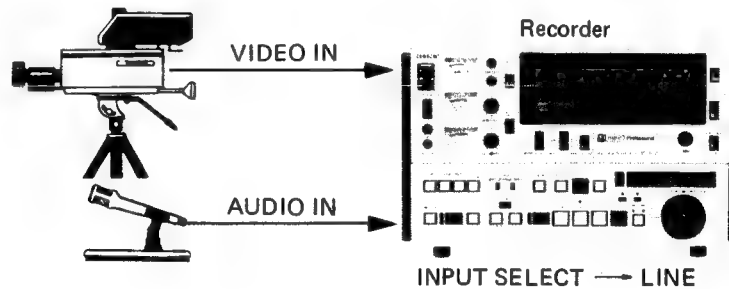
To record while editing using a signal from a video camera and signal from a player:  
Make connections as shown in the illustration.



- While recording the signal from the camera, set the player in the stop mode.

To record a signal from a video camera only:

Connect a video camera to the VIDEO IN connector of the recorder. Set the INPUT SELECT switch of the recorder to LINE.



### Operation

- Select the editing mode: assembly or insert.

#### Assembly editing

- Enter only the edit-in point of the recorder and start the recording of the camera signal with the AUTO EDIT button.
- At the point where the camera recording is to end, press the ENTRY and OUT buttons simultaneously.

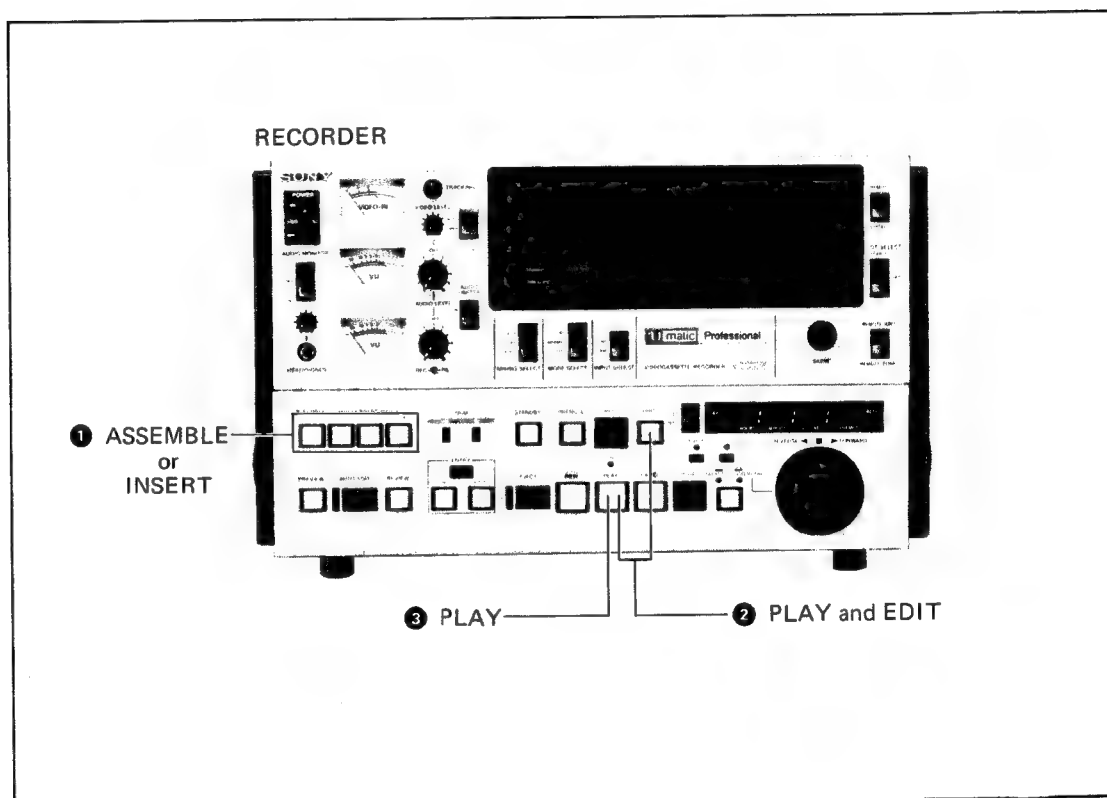
#### Insert editing

- Enter the edit-in and edit-out points of the recorder and start the recording of the camera signal with the AUTO EDIT button.  
You may also start recording with only the edit-in point entered and stop the recording by pressing the ENTRY and OUT buttons simultaneously.
- When assembly editing, the edit-out point cannot be entered on the recorder.

## MANUAL EDITING

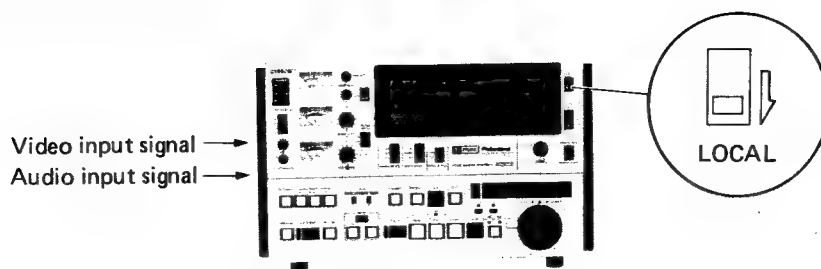
## Operation

- ① Select the editing mode: assembly or insert.
- ② During the playback of both the recorder and player, at the point where the scene is to begin, simultaneously press the **PLAY** and **EDIT** buttons on the recorder.  
Recording will begin at the point the buttons have been pressed.
- ③ At the point where the scene is to end, press the **PLAY** button on the recorder.  
The edit recording will stop and the playback will begin on the recorder.  
To stop the tape, press the **STOP** button.



- If the editing is started from the stop mode or if the editing is ended with the **STOP** button, the picture will be unstable at the edit-in or edit-out point.
- To obtain a perfectly stable playback picture, start the playback at least 5 seconds prior to the edit-in point.
- When the **PB/PB/EE** switch is set to **PB** during edit-recording, the simultaneous playback picture can be monitored.
- To see the dynamic-tracking playback picture on the player, carefully read the notes on pages 1-21 and 1-22.

## 1-6-2. Editing Using One BVU-820 Video Cassette Recorder

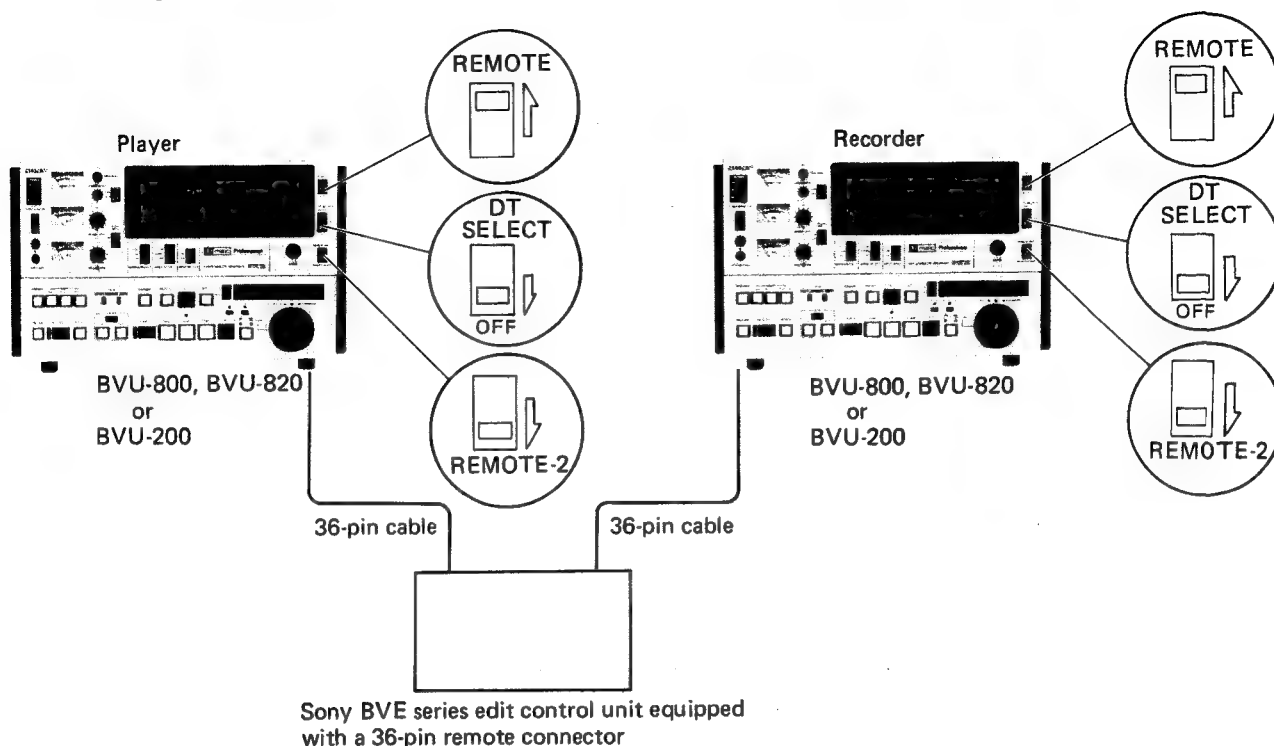


With this machine, if you connect a video and audio input signal, editing can be made as described on the previous pages.

### Notes:

- Set the REMOTE/LOCAL switch to LOCAL
- The entry of the edit-in and edit-out points, AUTO EDIT, PREVIEW, TRIM can be proceeded with this machine. Operate the input video and audio signal source separately.

### 1-6-3. Editing with a Conventional Control Unit

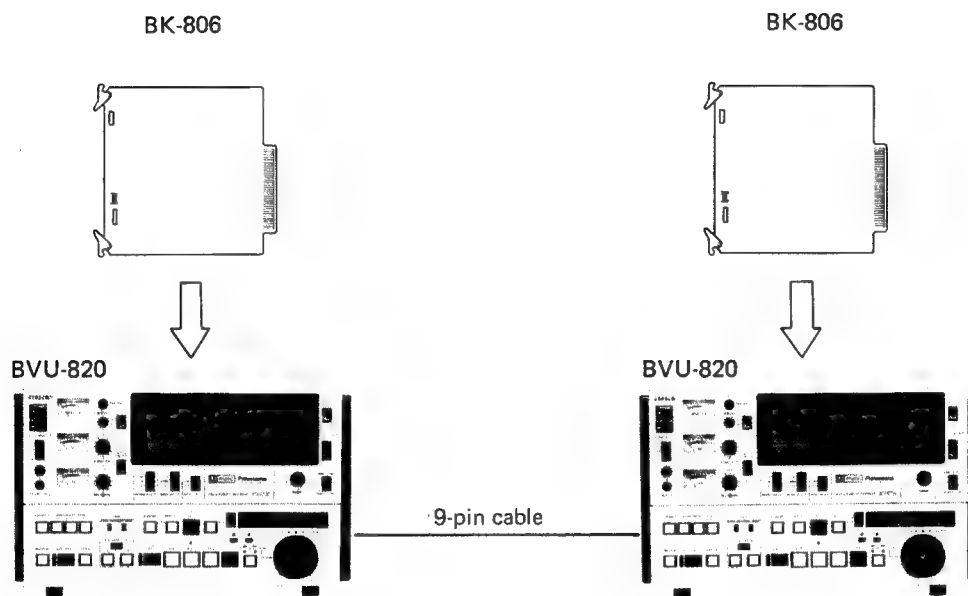


Use the function buttons on the control unit to remotely control the player and the recorder.

- Set the REMOTE/LOCAL switch to REMOTE if it is equipped.
- Set the REMOTE-1/REMOTE-2 switch to REMOTE-2.
- To remove the cassette in the machine, set the REMOTE/LOCAL switch to LOCAL and then press the EJECT button.  
To operate the machine, with the control unit, return the switch to the REMOTE position.
- The tape speed controlled with the BVE-500 series' search dial is as follows: If the DT SELECT switch is set to SEARCH or OFF, the tape speed at x2 position will be x5 and at x1/20 position will be x1/30, and if the DT SELECT switch is set to VAR, the tape speed at x-2 position will be x-1 and at x+2 position will be x+3. When the editing is performed, be sure to set the DT SELECT switch to OFF.
- When changing the mode of the BVU-820 from the search mode using a button on the BVE-500 series, be sure to keep the button pressed until the machine is set in your desired mode.
- When the buttons on the BVE-500 series are pressed, the appropriate lamps on the BVU-820 may not light. The lamps on the BVE-500 series indicate the correct operating mode of the player and recorder.
- When the search dial on the connected BVE-500A or the BVR-510 is set to PAUSE, the guardband noise may appear on a still picture even in the dynamic tracking playback mode. To avoid the noise, modification on the BVE-500A or the BVR-510 is required. For details, please refer to your Sony personnel.

# 1-6-4. Time Code Editing

## USING TWO BVU-820 VIDEO CASSETTE RECORDERS

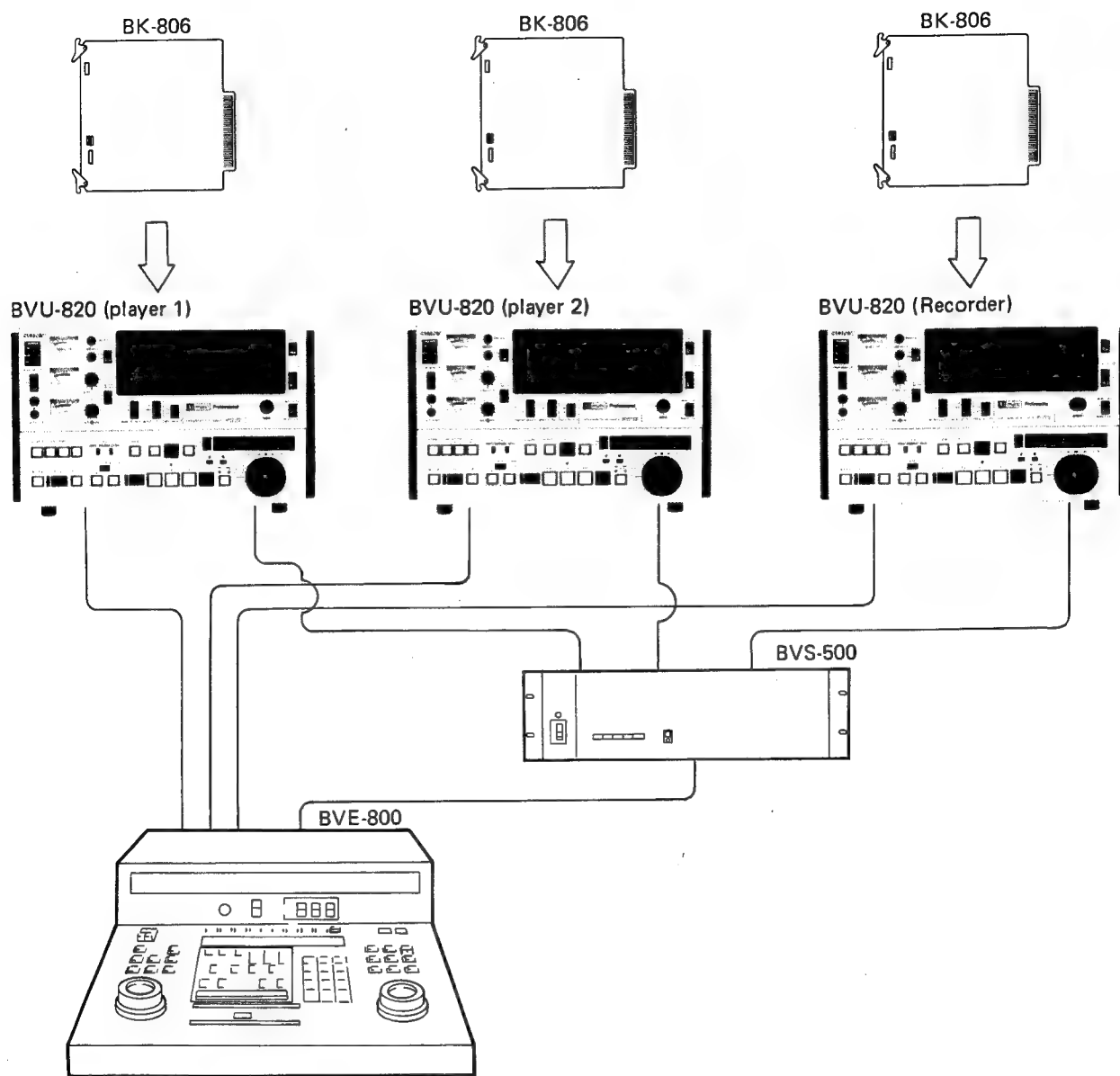


The recording and playback of time code and the time code editing will be possible when the BK-806 time code generator/reader is inserted into the BVU-820 instead of the TC-13 circuit board.

The input and output connections of the time code is not required for editing.

For details, refer to the instruction manual furnished with the BK-806.

## USING THE BVE-800 AND THE BVS-500



When the BVE-800 automatic editing control unit and the BVS-500 video and audio switcher are used together, the following operation will be possible.

- A/B roll editing (Three VTRs are controlled)
- Automatic split editing
- Auto-editing using the multievent memory
- Auto-search
- Tape punching of edit lists with the TTY
- Program length calculation
- Cue tone recording and playback
- Recording of slow and still picture (The playback picture should be connected using the TBC.)

For details, refer to the instruction manual furnished with the BVE-800 and BVS-500.

## 1-7. TAPE PROTECTION

In order to prevent any damage to the tape, the machine automatically goes into reset mode, when something wrong happens during operation.

For example;

– Fast forward/rewind/forward/reverse/stop/still mode:

When irregular reel rotation or tape tension is detected, system control forces machine to STOP or EJECT, then after 3 seconds, if irregular reel rotation or tape tension is still detected, reel motor power will turn off and mechanical brake is applied simultaneously.

– During threading/unthreading:

When irregular reel rotation or tape tension is detected, system control forces machine to STOP or EJECT.

– Irregular voltage, Sensor LED damage:

When irregular voltage at B + power line or sensor LED damage (no light) is detected, system control forces machine to STOP or EJECT, then mechanical brake is applied.

## 1-8. CLEANING THE HEAD

A KC-1C cleaning cassette (optional) is used to clean the video and audio heads. The tape is threaded into the unit in the same way as the video cassette.

1) Insert the cleaning cassette and press the PLAY button at once.

2) Run the tape for about 10 seconds.

3) Eject the cassette at once.

- Because the head rotates even in the stop mode, leaving the cassette in the machine cause the head worn out.
- To clean the head without using the KC-1C cleaning cassette, refer to Section 2 and follows.



## 1-9. CHECK ROUTINES

To check that all functions of the BVU-820 are operating properly, execute the following routines.

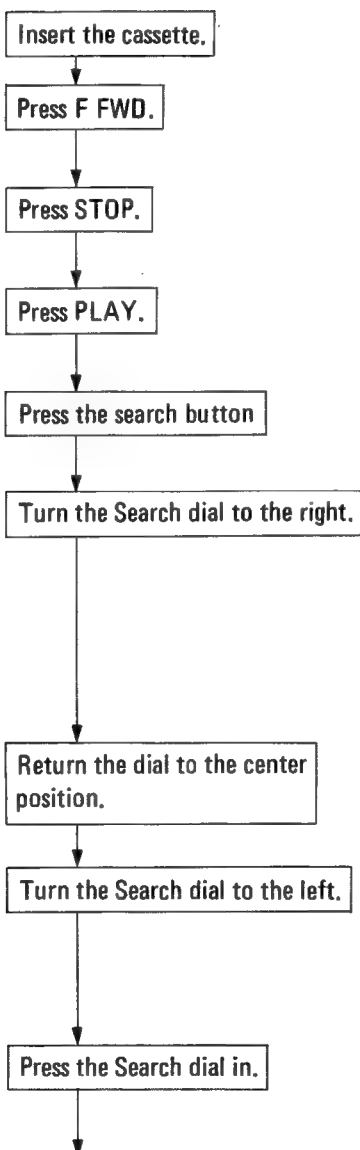
### To check playback functions

First, connect a video and audio monitor and prepare a video cassette tape on which video signals and audio CH-1 and CH-2 signals are recorded.

#### With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

#### Action



#### Check that

The playback picture of high speed appears and the video and audio are not muted.

A still picture appears.

The playback picture appears. Audio CH-1 and CH-2 are heard.

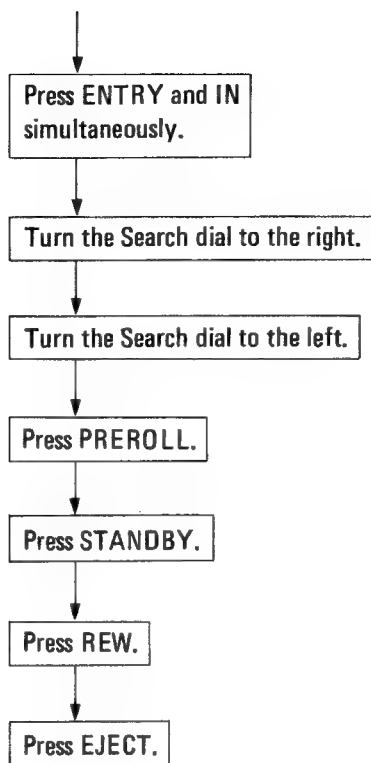
The search lamp lights.

The playback speed changes from low to high. When the dial is turned to the position at which a click is felt, the machine enters into the fast forward mode (×10). (When the machine enters into the fast forward mode, the pinch roller is released and the picture is stopped or distorted for a moment.)  
 The SHUTTLE lamp lights.

The still picture appears.

The reverse playback picture appears. The speed changes from low to high. When the dial is turned to the position at which a click is felt, the machine enters into the rewind mode (×10).

The still picture appears.  
 The JOG lamp lights.



IN lamp lights.  
Note the counter number of the point (edit-in).

The forward playback picture in the jog mode appears.

The reverse playback picture in the jog mode appears.

The tape runs to a point 5 seconds prior to the edit-in point and stops. A still picture appears.

STANDBY lamp goes off.

The tape rewinds. The E-to-E mode picture appears. At the beginning of the tape, the tape stops automatically.

The cassette is ejected.

PB/PB/EE : PB/EE

## To check dynamic-tracking playback functions

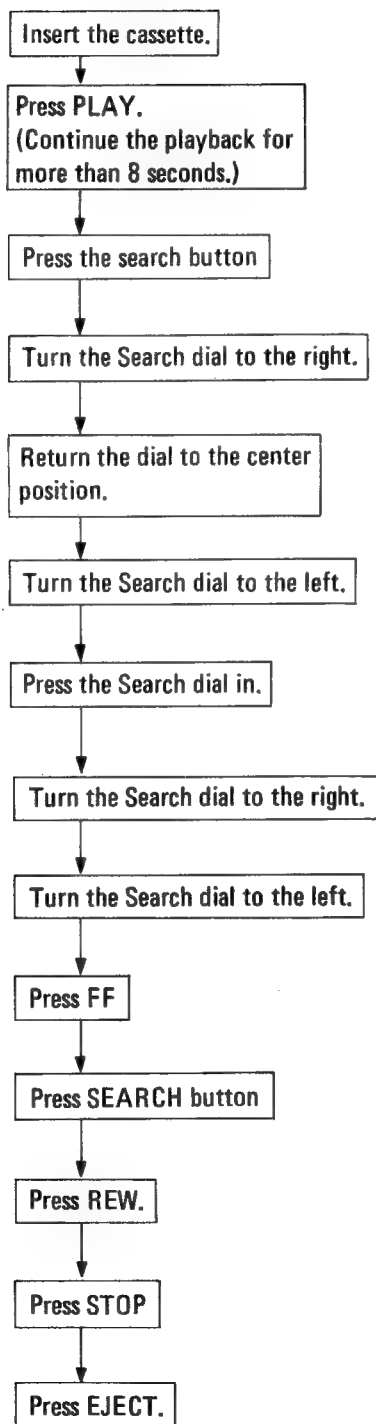
First, connect a video and audio monitor and prepare a video cassette tape on which video signals and audio CH-1 and CH-2 signals are recorded.

- Be sure to use the time base corrector.

With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : VAR  
 MODE SELECT : TBC

Action



Check that

The playback picture appears. Audio CH-1 and CH-2 are heard.

The search lamp lights.

The noiseless forward picture appears in the SHUTTLE mode.

The noiseless still picture appears.

The noiseless reverse picture appears in the SHUTTLE mode.

The noiseless still picture appears in the JOG mode.

The noiseless forward picture appears in the JOG mode.

The noiseless reverse picture appears in the JOG mode.

The noiseless still picture appears.

The still picture with noise appears.

The cassette is ejected.

# To check recording functions

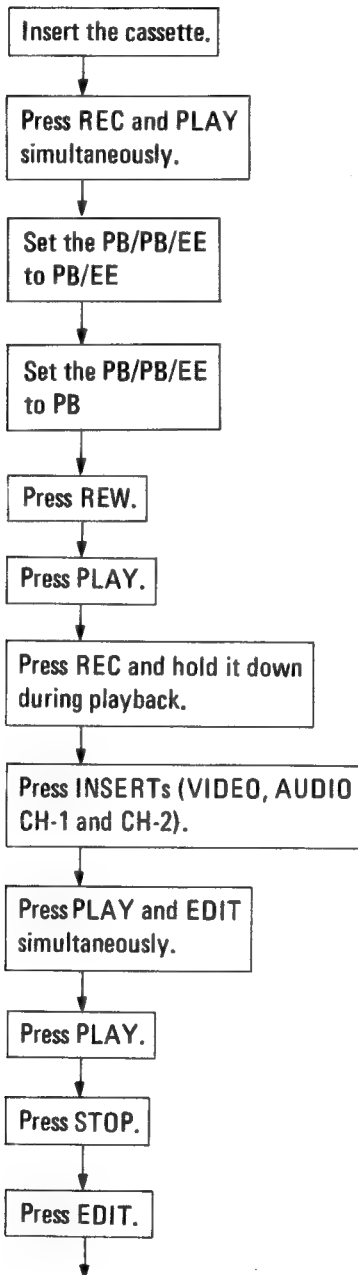
First,

- Prepare a video cassette tape on which recording can be made.
- Connect signals to the VIDEO IN, AUDIO IN CH-1 and CH-2 connectors.
- Connect a video and audio monitor, and set the monitor to the internal sync mode.

With switches set to

POWER : ON  
REMOTE/LOCAL : LOCAL  
INPUT SELECT : LINE  
PB/PB/EE : PB  
AUDIO MONITOR: MIX  
DT SELECT : OFF

## Action



## Check that

The recording begins.  
Simultaneous playback picture appears.

E-to-E mode picture appears.

Simultaneous playback picture appears.

The tape rewinds.  
Rewind the tape to the beginning of recording and stop the tape.

Playback of the recorded scene appears. The audio CH-1 and CH-2 are heard.

E-to-E mode picture appears while the REC is pressed.

The VIDEO, AUDIO CH-1 and AUDIO CH-2 lamps light.

The manual edit recording will begin.

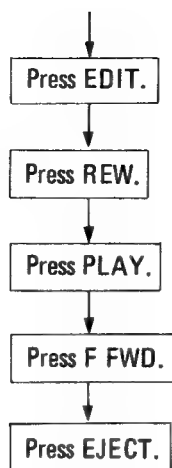
The edit recording will stop, but the tape will continue to run in the playback mode.

Still picture of the tape appears.

The E-to-E mode picture and sound selected by the INSERT buttons appear.

PB/PB/EE

:PB/EE



The E-to-E mode picture and sound disappear and the still picture of the tape appears.

The tape rewinds.  
Rewind the tape to the beginning of edit-recording and stop the tape.

Playback of the edit-recorded scene appears. The audio CH-1 and CH-2 is heard.

The tape advances rapidly and stops at the end of the tape. Then the tape rewinds automatically and stops at the beginning.

The cassette is ejected.

# To check editing functions

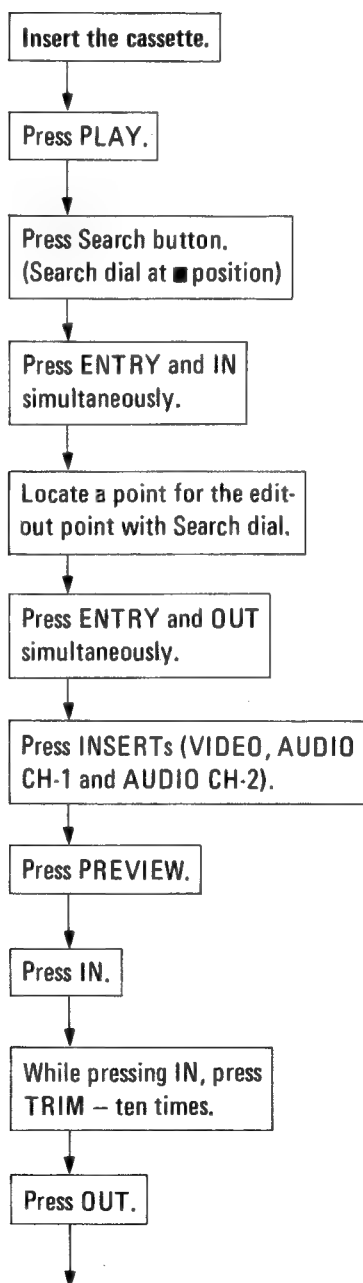
First,

- Prepare a tape on which video, audio CH-1 and audio CH-2 are recorded.
- Connect signals to the VIDEO IN and AUDIO IN connectors.
- Connect a video and audio monitor.

With switches set to

POWER : ON  
REMOTE/LOCAL : LOCAL  
AUDIO MONITOR: MIX  
DT SELECT : OFF

Action



Check that

Playback picture appears.

The still picture appears.

Note the counter number of the point (edit-in).

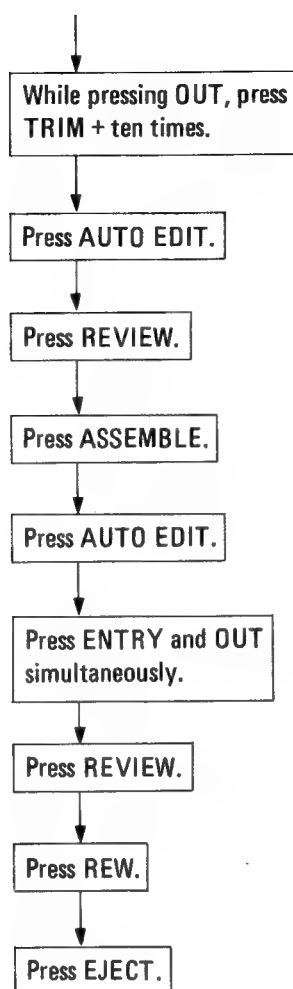
Note the counter number of the point (edit-out).

Previewing proceeds.

The counter number of the edit-in point is displayed.

The counter number decreases by ten frames.

The counter number of the edit-out point is displayed.



The counter number increases by ten frames.

Auto edit recording proceeds.

The reviewing of the edit recorded scene proceeds.

The ASSEMBLE button lights.

The point where the AUTO EDIT has been pressed is entered as the edit-in point and auto edit recording begins.

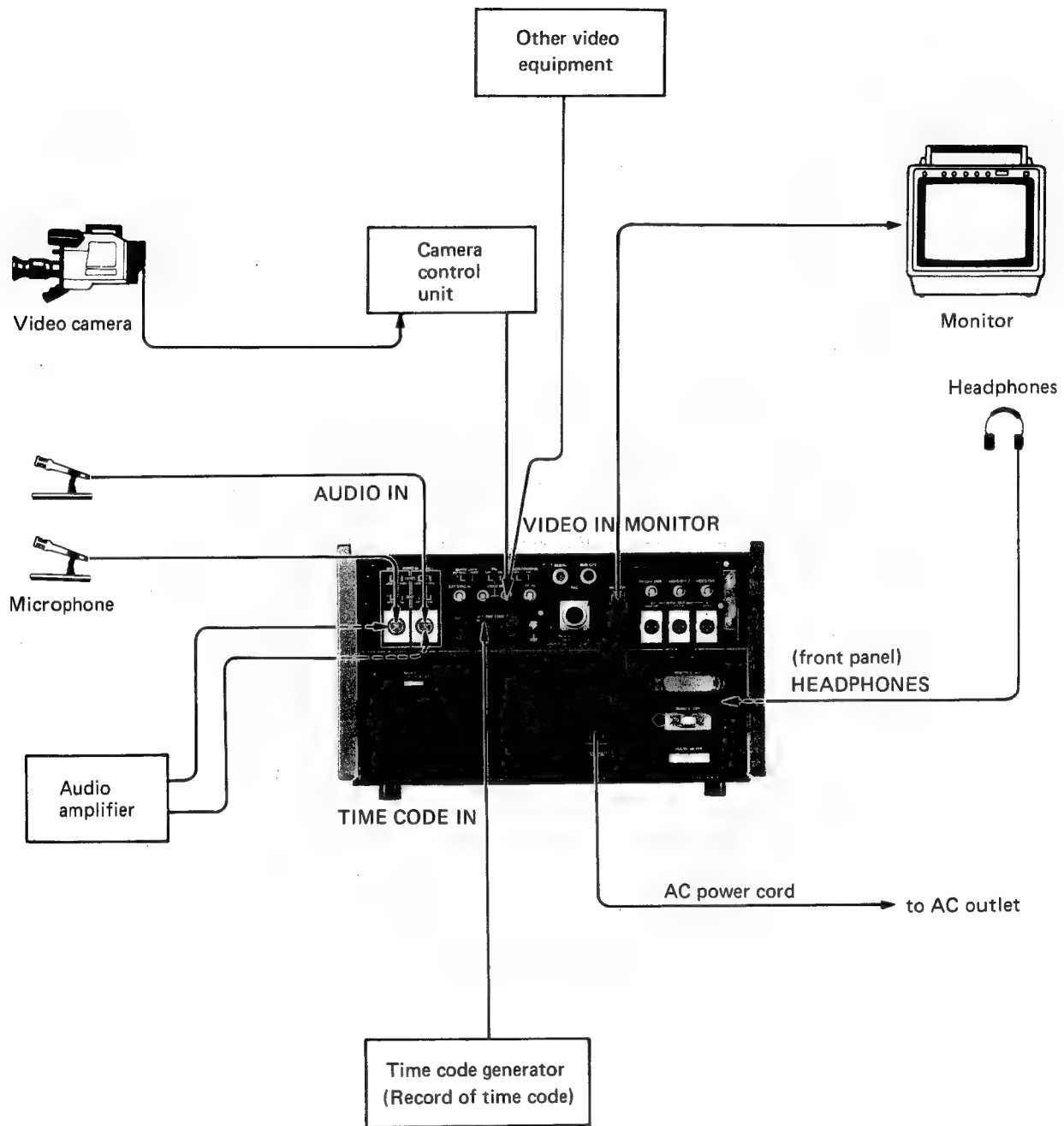
The point is entered as the edit-out point and auto edit recording stops.

The reviewing of the edit recorded scene is proceeded.

The tape stops at the beginning.

The cassette is ejected.

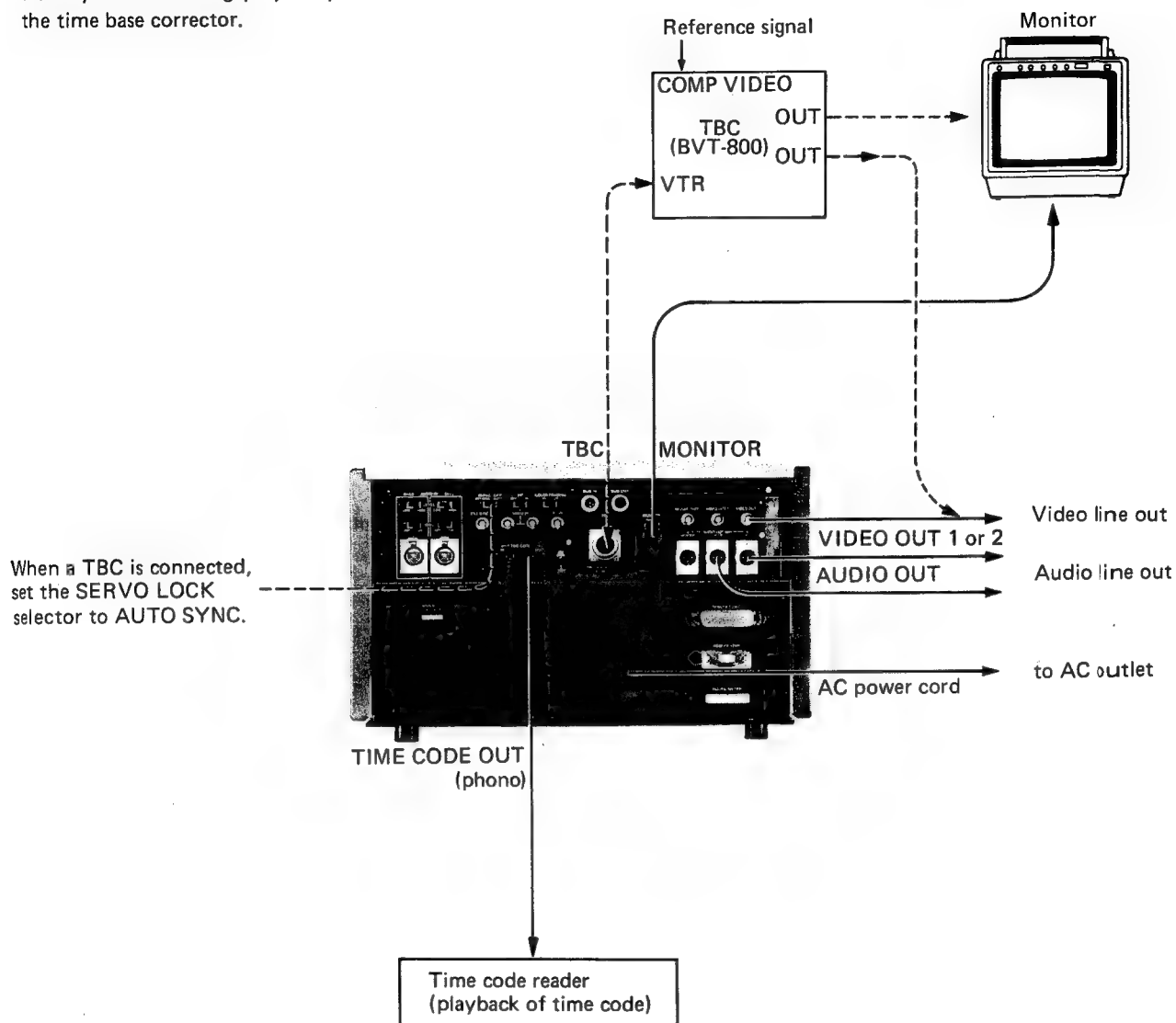
# 1-10. CONNECTIONS RECORDING





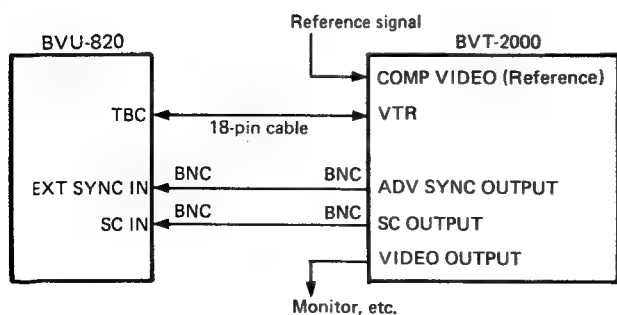
## PLAYBACK

- for connecting a BVT-800 time base corrector
- For dynamic tracking playback, be sure to use the time base corrector.

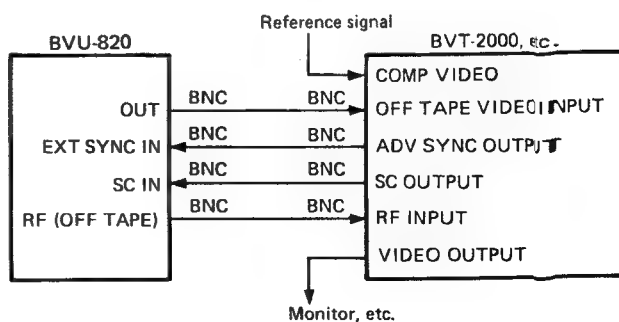


When a time base corrector other than BVT-800 is used, connect it as follows.

- To connect a BVT-2000 using an 18-pin cable

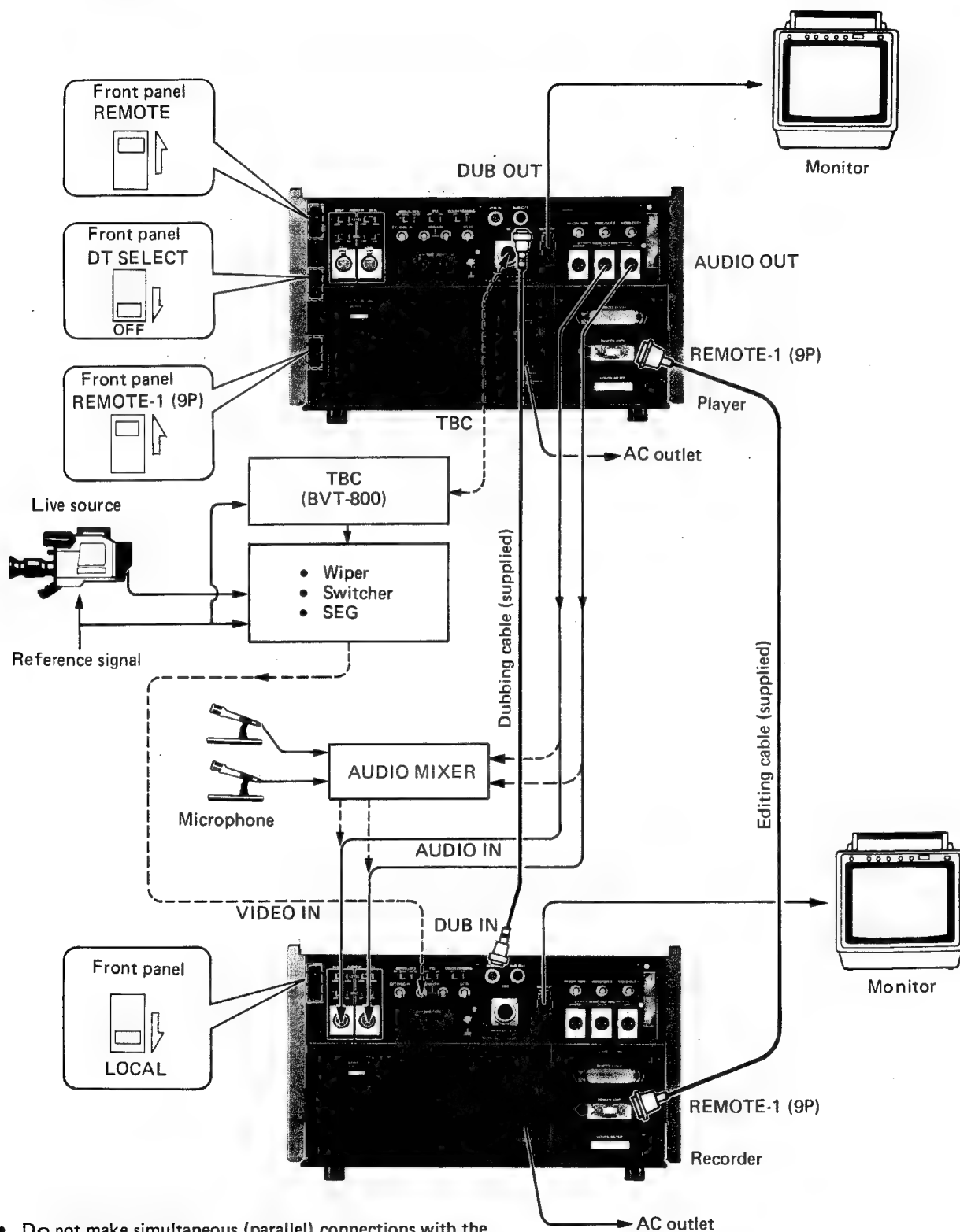


- To connect a time base corrector without using an 18-pin cable



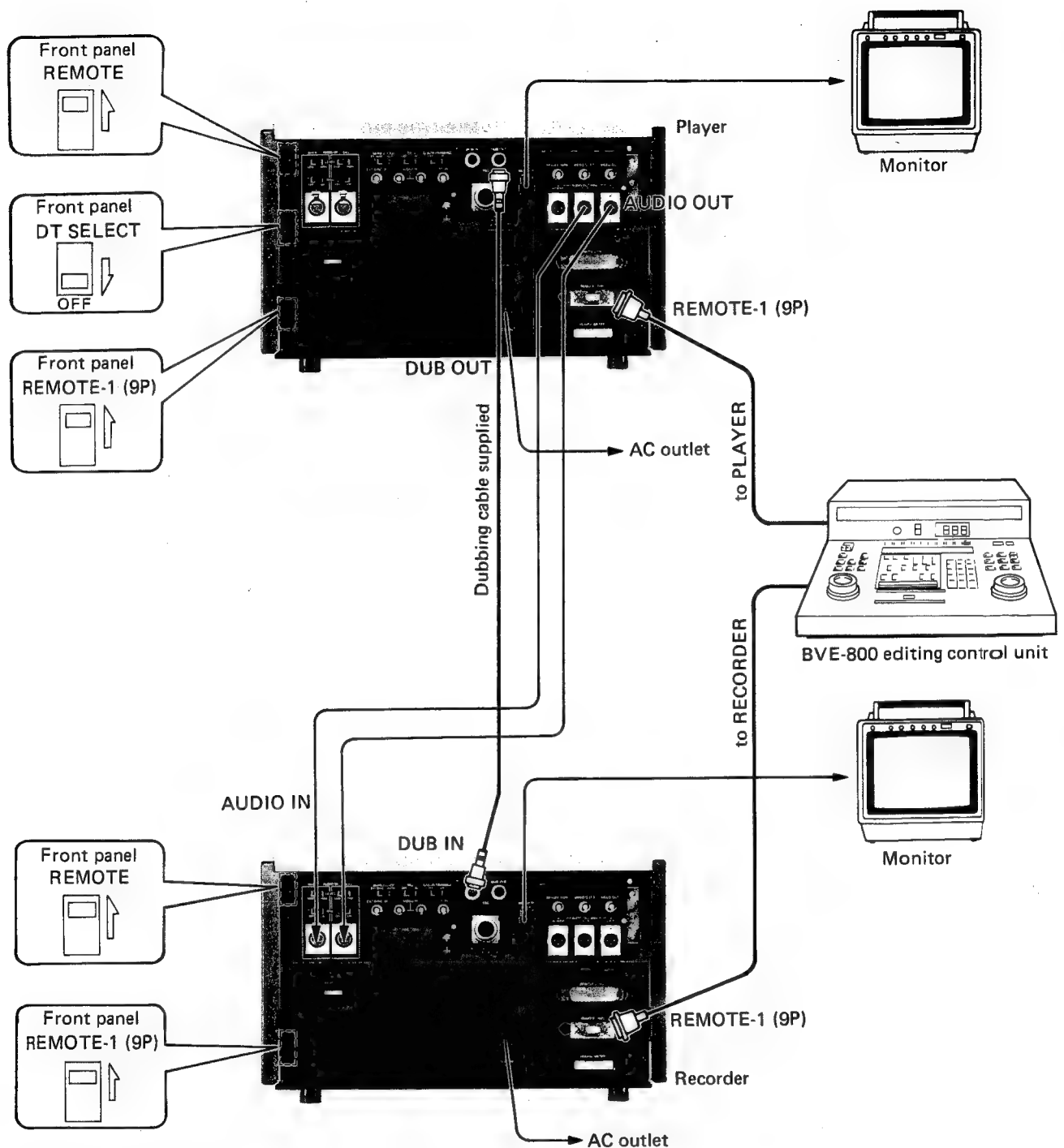
# EDITING — Editing with two BVU-820s —

----- connecting a source for live edit



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and DUB OUT connector on the recorder.

# EDITING – Editing with a control unit –



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and the DUB OUT connector on the recorder.
- For the live source connection, see the previous pages.
- The video cassette recorder with 36 pin or 9 pin connector can be connected other than the BVU-820, but the function is limited according to the function of the machine.
- To use the BVE-500A, BVE-1000 or BVE-5000 editing control unit, refer to the instruction manual furnished with the equipment.

# 1-11. SPECIFICATIONS

## MECHANICAL

<b>Weight</b>	38 kg (83 lb 12 oz)
<b>Dimensions</b>	454 x 283 x 550 mm (17 <sup>7</sup> / <sub>8</sub> x 11 <sup>1</sup> / <sub>4</sub> x 21 <sup>3</sup> / <sub>4</sub> inches) (w/h/d)
<b>Operating position</b>	Horizontal
<b>Tape transport mechanism</b>	U-matic system (3/4-inch KCA, KCS cassettes)
<b>Tape speed</b>	9.53 cm/s
<b>Wow/flutter</b>	less than 0.2% rms
<b>Record/playback time</b>	60 min. maximum with KCA-60 video cassette
<b>Fast forward time</b>	Less than 4 min. with KCA-60 video cassette
<b>Rewind time</b>	Less than 2.5 min with KCA-60 video cassette
<b>Search speed</b>	<b>SHUTTLE:</b> DT SELECT switch→SEARCH, OFF Still, 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 10 times normal in forward and reverse direction (Noiseless playback is possible.) <b>DT SELECT switch→VAR</b> 1 time in reverse direction to 3 times in forward direction (Noiseless playback) <b>JOG:</b> Still to 1 in forward and reverse direction (Noiseless playback is possible.)
<b>Connectors</b>	
AC IN	3-pin AC connector
VIDEO IN x2	BND connectors
VIDEO OUT x2	BNC connectors
AUDIO IN CH-1/L, CH-2/R	XLR female connectors
AUDIO OUT CH-1/L, CH-2/R	XLR male connectors
AUDIO OUT MONITOR	XLR male connectors
TIME CODE IN	RCA phono jack
TIME CODE OUT	RCA phono jack
DUB IN	7-pin male connector
DUB OUT	7-pin female connector
SC IN	BNC connector

<b>EXT SYNC IN</b>	BNC connector
<b>RF (OFF TAPE)</b>	BNC connector
<b>TBC</b>	CCY connector
<b>MONITOR OUT</b>	8-pin connector
<b>REMOTE (36-p)</b>	36-pin connector
<b>REMT0E (9-p)</b>	RS-422 9-pin connector
<b>HEADPHONES</b>	JM-60 headphones binaural jack
<b>Operating temperature</b>	+5°C to +40°C
<b>Storage temperature</b>	-20°C to +60°C

## ELECTRICAL

<b>Power requirements</b>	AC 100/120/220/240 V ±10% (Selectable), 48 to 64 Hz
<b>Power consumption</b>	170W
<b>Editing functions</b>	ASSEMBLE and INSERT (VIDEO, AUDIO CH-1, AUDIO CH-2), AUTO EDIT, MANUAL EDIT PREVIEW, REVIEW, PREROLL, TRIM

## VIDEO

<b>Video recording system</b>	Luminance: FM Chroma: SC low-range conversion
<b>Input</b>	NTSC composite video, sync negative 1.0 Vp-p <sup>+1.0</sup> / <sub>-0.5</sub> V, 75Ω, unbalanced
<b>Output</b>	NTSC composite video, sync negative 1.0 Vp-p ± 0.2 V, 75Ω, unbalanced
<b>Dubbing input</b>	Luminance signal: 1.7 Vp-p ± 0.2 V Sync negative, Impedance: 500Ω ± 10% Chroma signal: 0.9 Vp-p ± 0.1V, Impedance: 1 kΩ ± 10%
<b>Dubbing output</b>	Luminance signal: 1.7 Vp-p ± 0.2 V Sync negative Impedance: 500Ω ± 10% Chroma signal: 0.9 Vp-p ± 0.1 V Impedance: 1 kΩ ± 10%
<b>Horizontal resolution</b>	340 lines (monochrome mode) 260 lines (color mode)
<b>Signal to noise ratio</b>	More than 49 dB (monochrome mode when the sharpness switch is set to ON) More than 47 dB (color mode when the sharpness switch is set to ON) More than 51 dB (monochrome mode when the sharpness switch is set to OFF) More than 49 dB (color mode when the sharpness switch is set to OFF)

# AUDIO

Input	(MIC)	-60 dB, 3 k-ohms, balanced (matches 600-ohm microphones)
	(LINE)	+4 dB, 10 k-ohms/600 ohms, balanced
Output	(LINE)	+4 dB, low impedance, balanced (600-ohm load permissible)
	(HEADPHONES)	-46 to -26 dB, 8 ohms load, binaural
	(MONITOR)	+4 dB, 600-ohm load, balanced
Distortion		Less than 2.0% (1 kHz reference level)
Frequency response		50 Hz to 15 kHz
Signal to noise ratio		48 dB (at 3% distortion level)
TIME CODE input		0 dB $\pm$ 6 dB, 10 k-ohms, unbalanced (0 dB = 1.55 Vp-p pulse)
TIME CODE output		0 dB $\pm$ 3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)

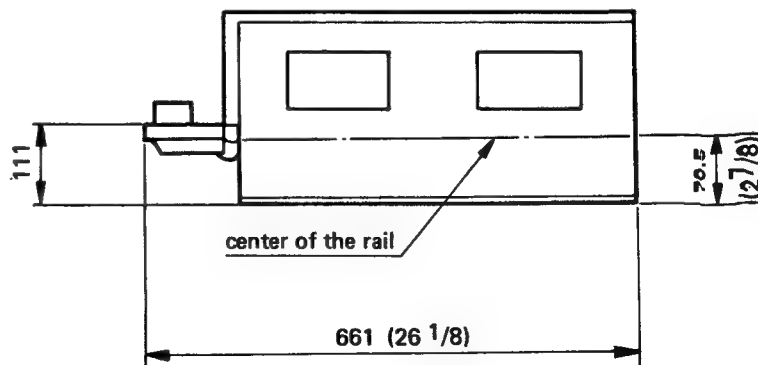
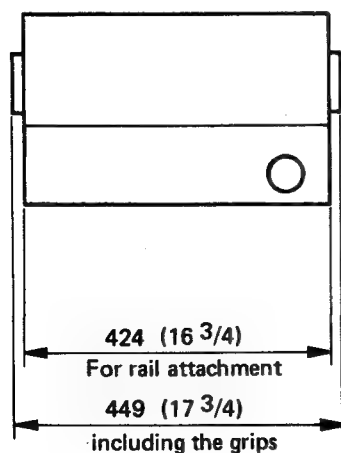
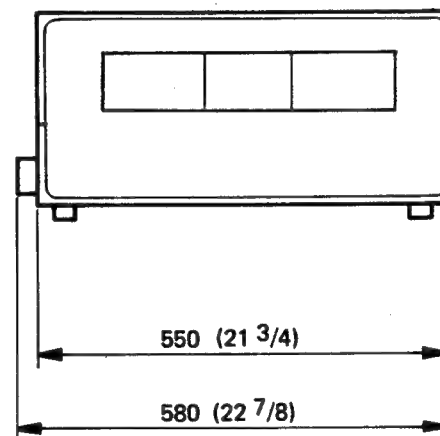
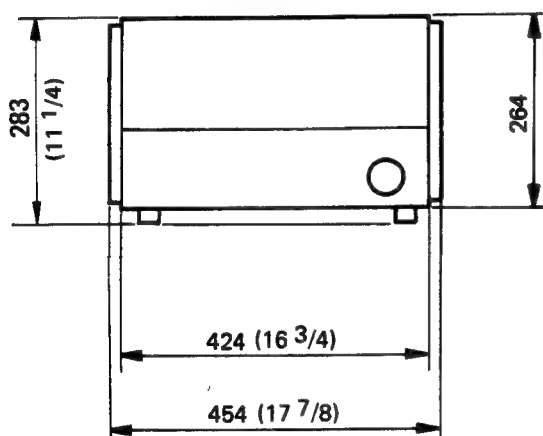
SC input	2 Vp-p $\pm$ 1V, 75 ohms, unbalanced
SYNC input	0.2 Vp-p to 5 Vp-p, negative, 75 ohms, unbalanced (1 Vp-p $\pm$ 0.2 V with VIDEO input)
RF output (OFF TAPE)	0.5 Vp-p $\pm$ 0.1 V, 75 ohms, unbalanced

## Accessories supplied

AC power cord	1
Dubbing cable VDC-5 (5 m)	1
Remote control cable (9 pin-9 pin) RCC-5G	1
Extension board EX-7	1
Operation and maintenance manual	1

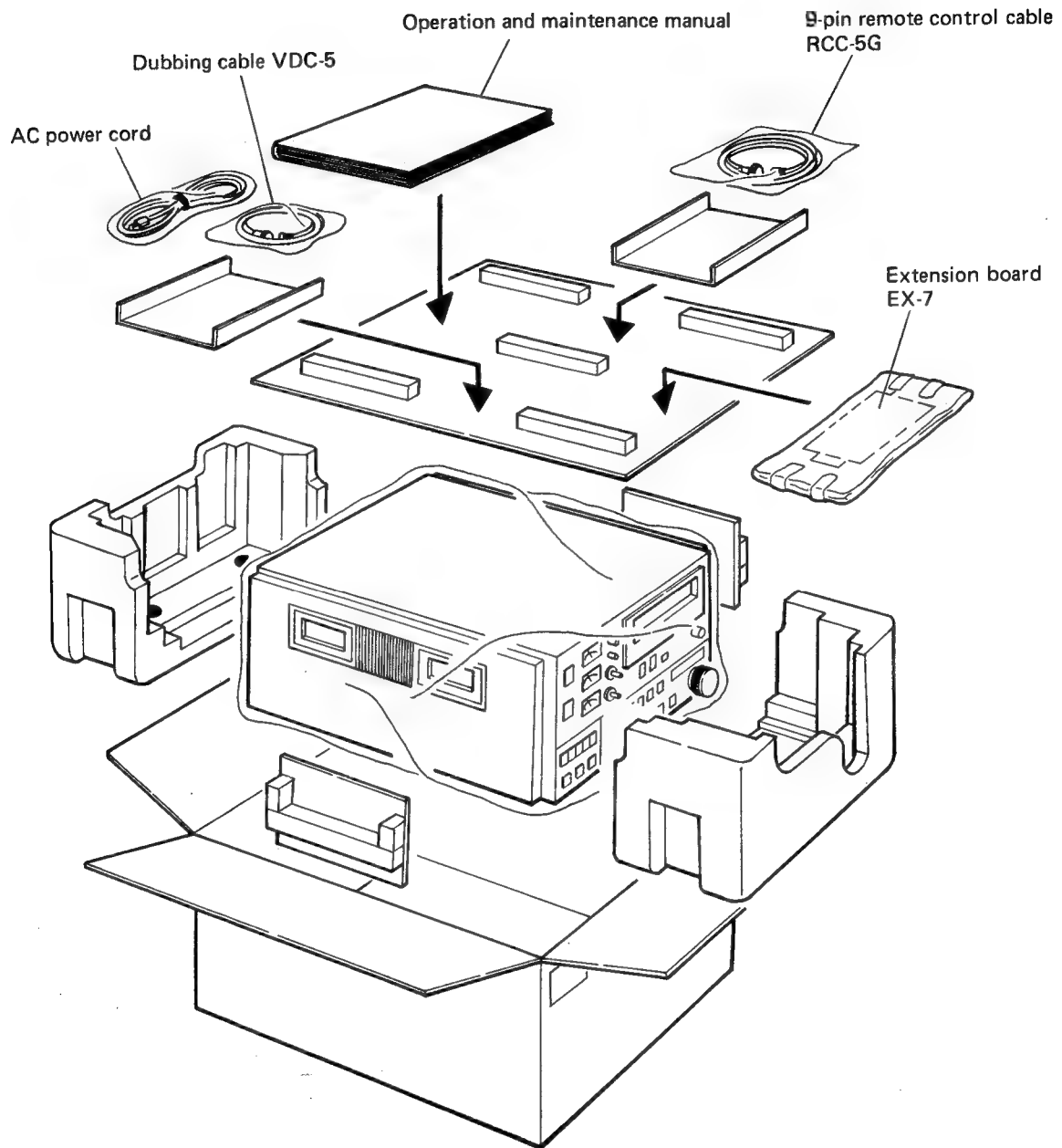
Design and specifications subject to change without notice.

## VIEW OF EXTERIOR



UNIT: mm (inch)

## 1-12. REPACKING FOR SHIPMENT

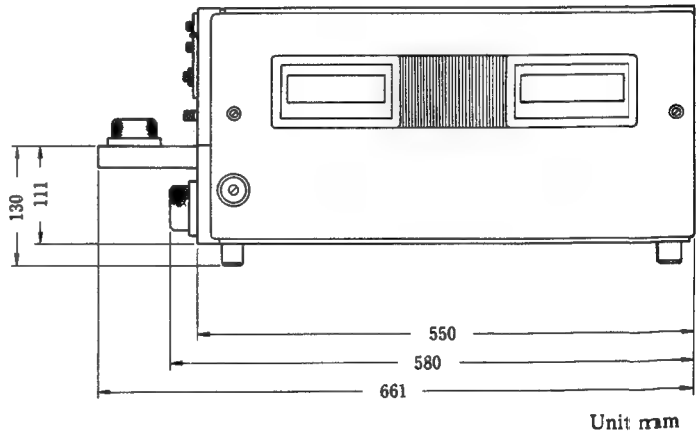
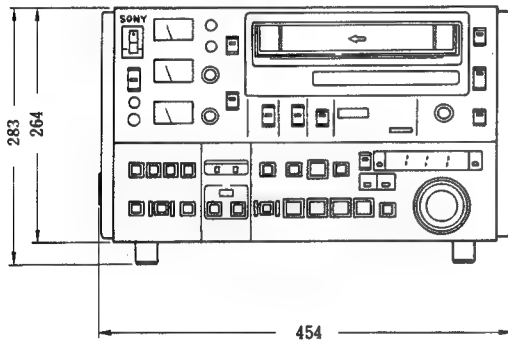


## SECTION 2 INSTALLATION

Be sure to install the BVU-820 at the installation space under the required operational environment as regulated below. It will assure the BVU-820's superior performance while maintaining the excellent serviceability and accessibility.

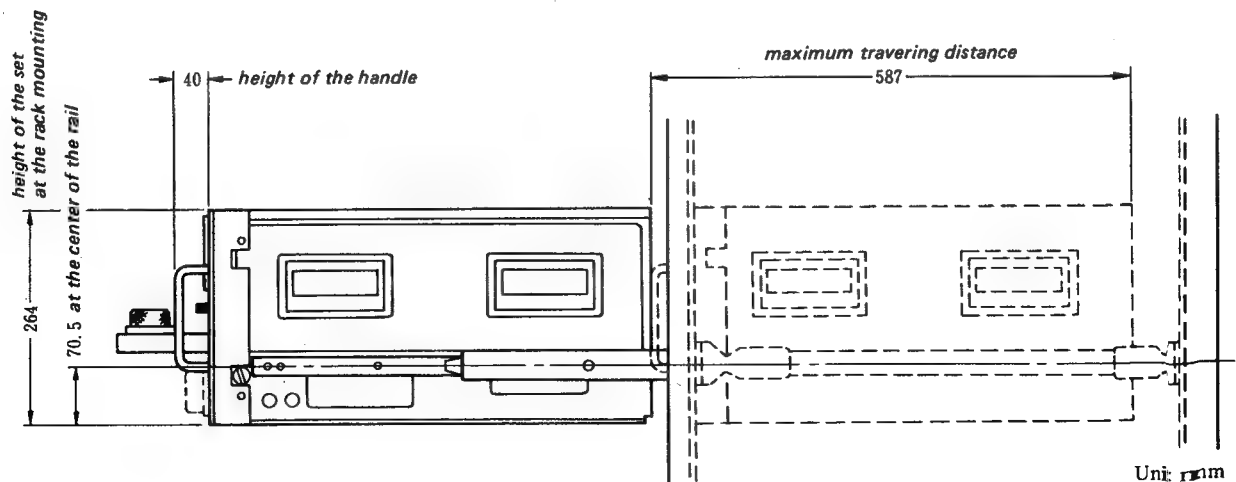
### 2-1. OPERATIONAL ENVIRONMENT

- Areas where the BVU-820 will be exposed to direct sunlight, or any other strong direct lights.
- Avoid installation in dusty areas or areas where it is subject to vibration.
- Avoid areas where high electric or magnetic fields are to be found.
- Good air circulation is essential to prevent internal heat buildup. Place the set in locations with sufficient air circulation. Do not block the ventilation holes on the cabinet and the rear panel.
- Avoid installation in a location near heat sources. The set should only be operated in a temperature range from 5°C to 40°C.



Unit: mm

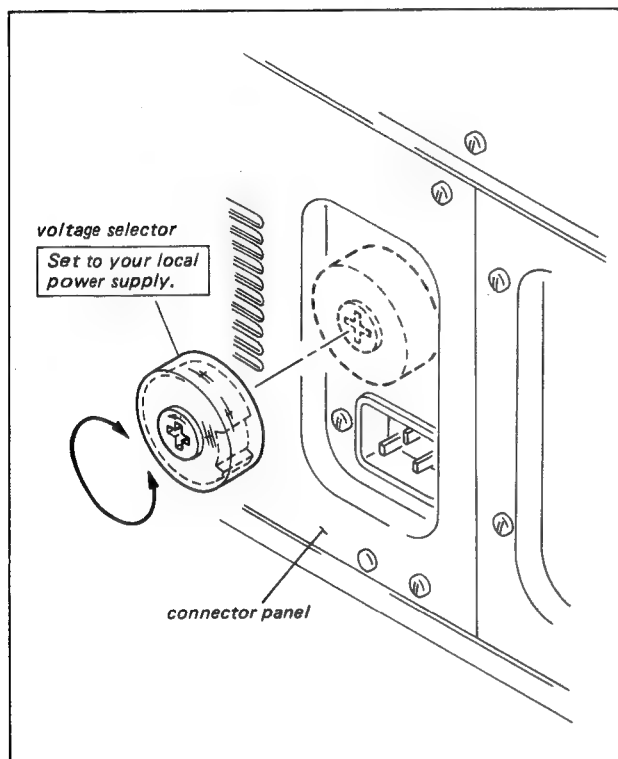
When the BVU-820 is mounted in a rack.



Unit: mm

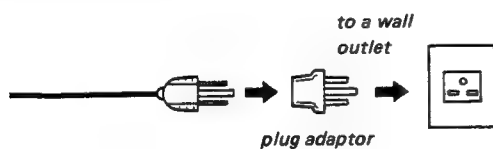
### 2-3. OPERATING VOLTAGE

The BVU-820's power line voltage can be set to 100 V, 120 V, 220 V or 240 V for use anywhere in the world. Before connecting the set to the power source, check that the operating voltage of your set is identical to that of your local power supply. The BVU-820 can operate on either 50 Hz or 60 Hz.



#### Note on AC power connection

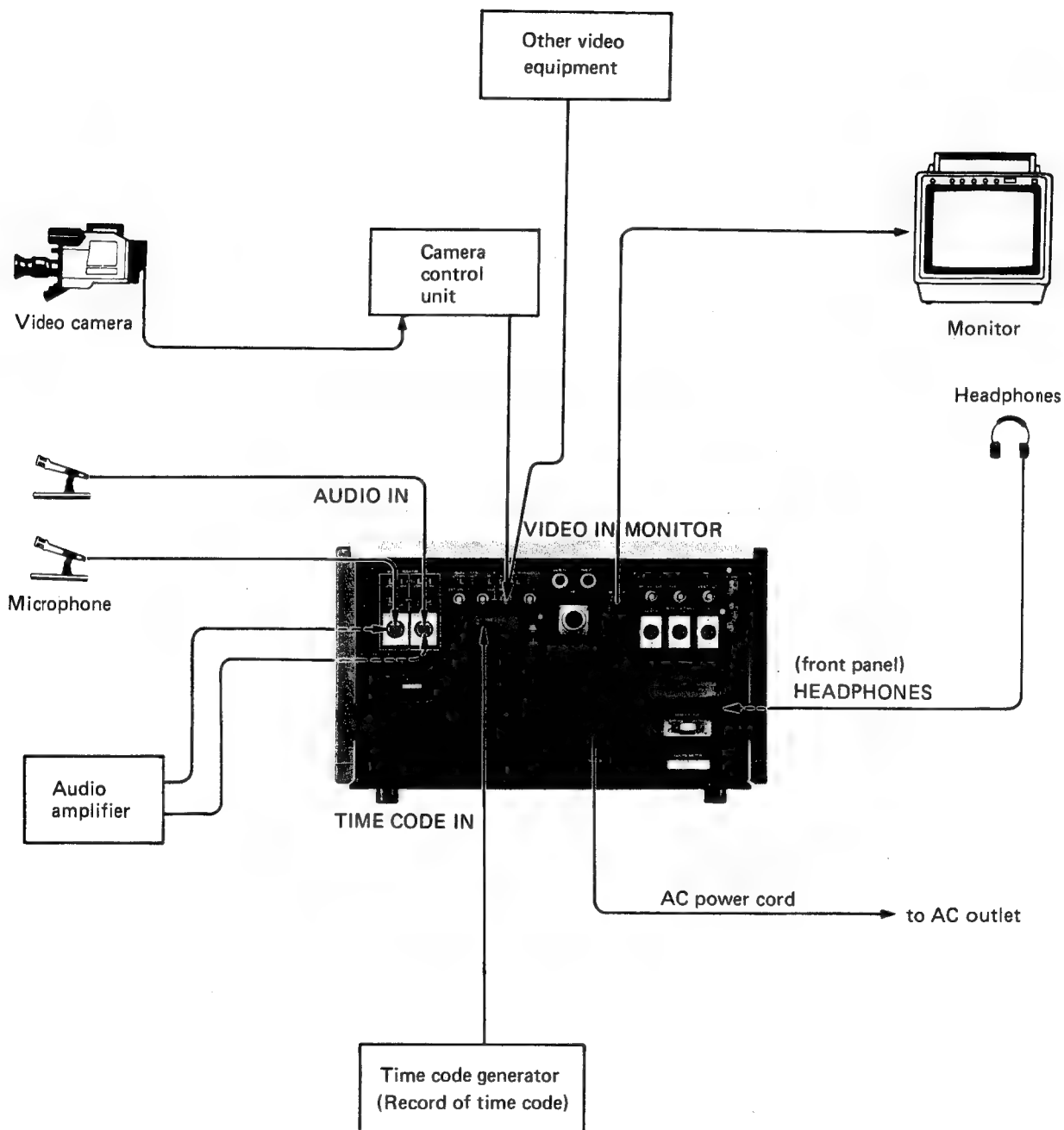
To use the set in other countries on 220 or 240 V ac, set the VOLTAGE SELECTOR to 220 or 240 V and use a commercially available plug adaptor as illustrated.





## 2.4. CONNECTIONS

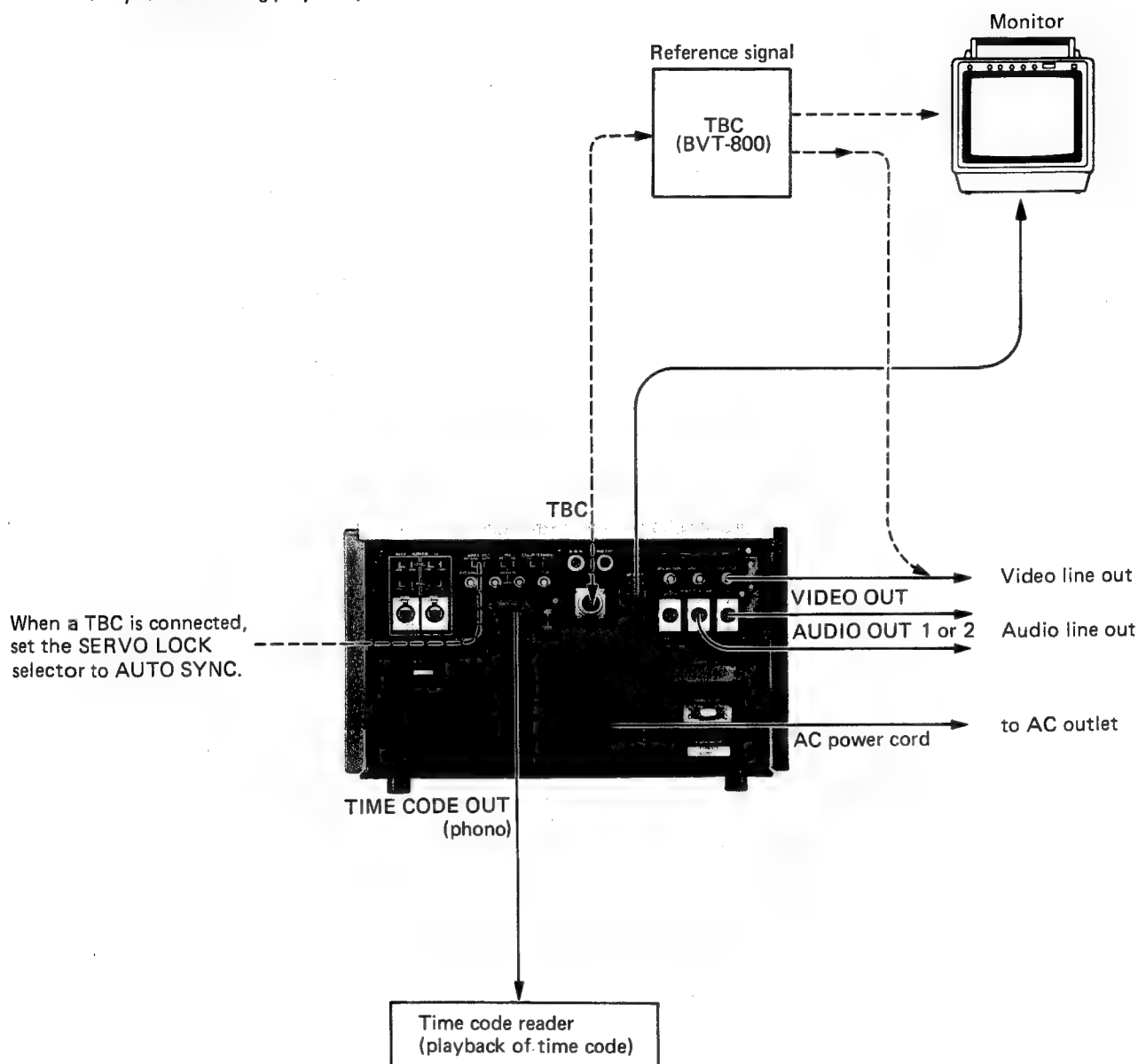
### RECORDING



# PLAYBACK

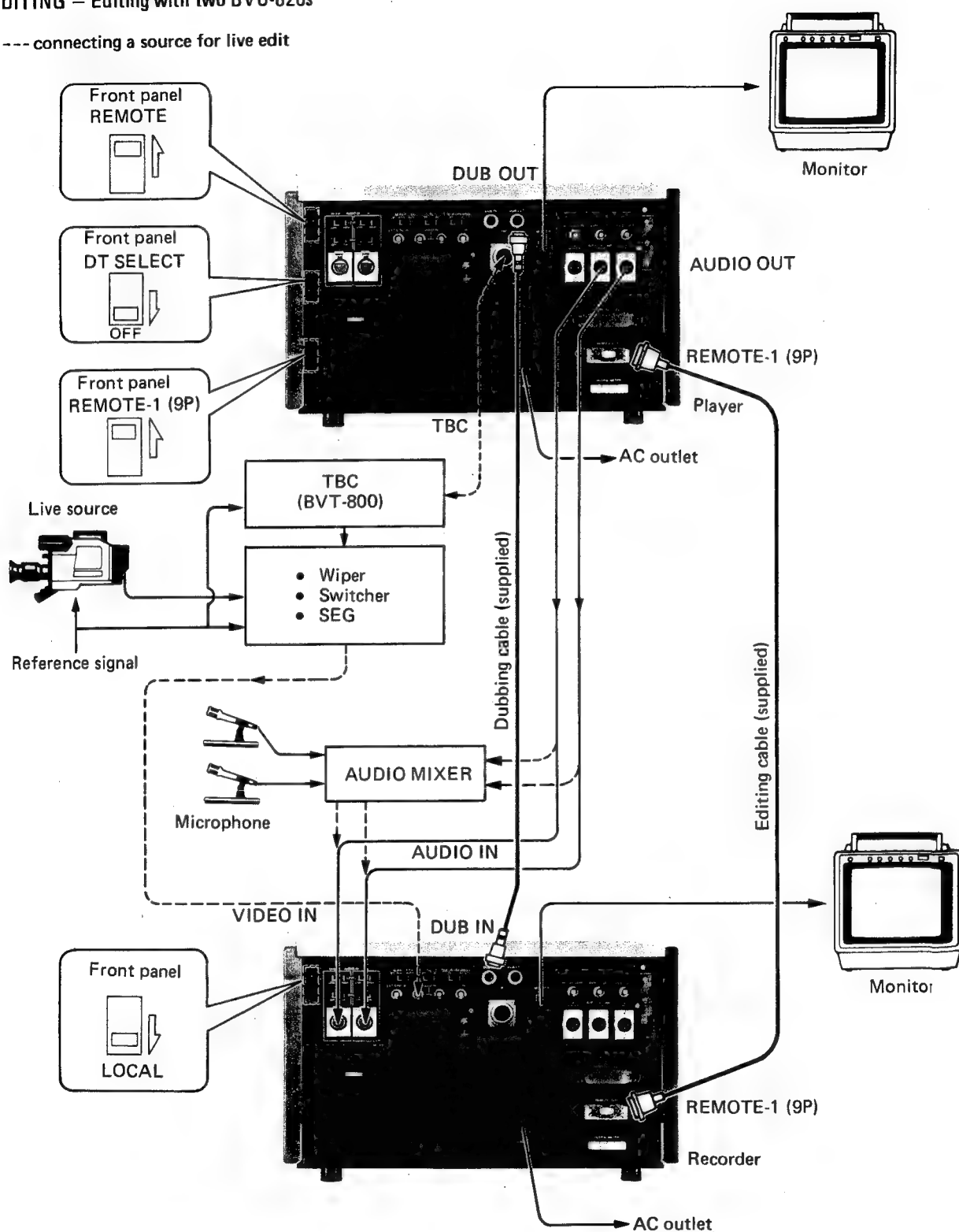
----- for connecting a BVT-800 time base corrector

For dynamic tracking playback, be sure to use the time base corrector.



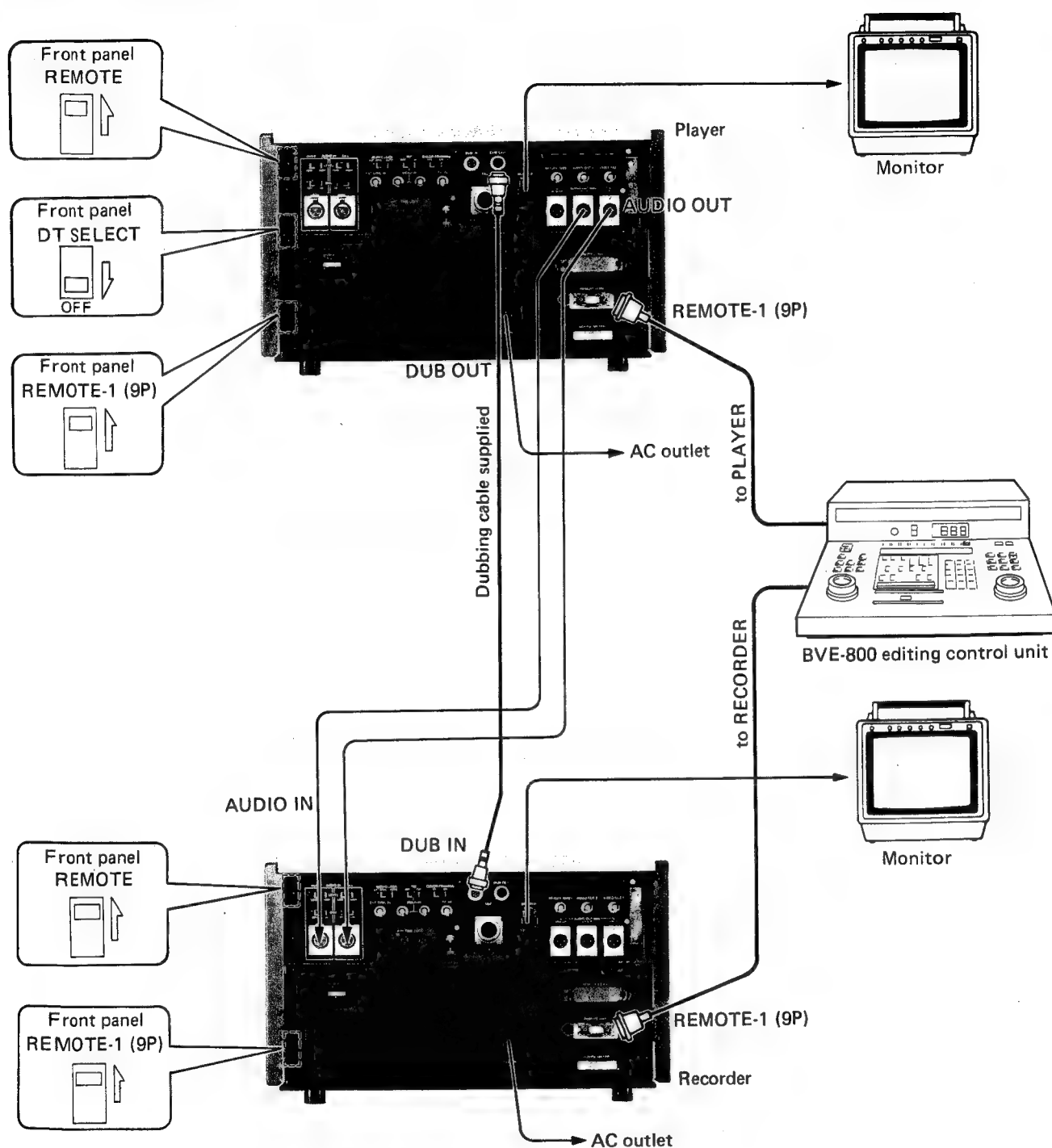
# EDITING – Editing with two BVU-820s –

----- connecting a source for live edit



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and DUB OUT connector on the recorder.

EDITING — Editing with a control unit —



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and the DUB OUT connector on the recorder.
- For the live source connection, see the previous pages.
- The video cassette recorder with 36 pin or 9 pin connector can be connected other than the BVU-820, but the function is limited according to the function of the machine.
- To use the BVE-500A, BVE-1000 or BVE-5000 editing control unit, refer to the instruction manual furnished with the equipment.

## 2-5. INPUT/OUTPUT SIGNAL OF THE CONNECTOR

Input and output signal of the main connectors on the connector panel are follows:

### INPUT

VIDEO IN	: 1.0 Vp-p <sup>+1.0</sup> <sub>-0.5</sub> V, sync negative, 75 ohms, unbalanced
EXT. SYNC IN	: 0.2 Vp-p ~ 5 Vp-p, negative, 75 ohms, unbalanced (1 Vp-p ±0.2 V with VIDEO input)
SC IN	: 2 Vp-p ±1 V, 75 ohms, unbalanced
AUDIO IN	: MIC: -60 dB, 3 k-ohms, balanced (matches 600 ohm microphone) LINE: +4 dB, 10 k-ohms/600 ohms, balanced
TIME CODE IN	: 0 dB ±6 dB, 10 k-ohms, unbalanced (0 dB = 1.55 Vp-p pulse)

### OUTPUT

VIDEO OUT	: 1.0 Vp-p, ±0.2 V, sync negative, 75 ohms, unbalanced
RF OUT (OFF TAPE)	: 0.5 Vp-p ±0.1 V, 75 ohms, unbalanced
AUDIO OUT	: LINE: +4 dB, low impedance, balanced (600 ohm load permissible) MONITOR: +4 dB, 600 ohm load, balanced HEADPHONES: -46 dB ~ -26 dB, 8 ohms load, binaural
TIME CODE OUT	: 0 dB ±3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)

### REMOTE CONTROL

#### REMOTE 2 (36P)

Pin	I/O Signal	Pulse Width
1	UNREG 5 V	(dc)
2	L-FF COMMAND IN	more than 5 msec.
3	L-FWD COMMAND IN	more than 5 msec.
4	L-REW COMMAND IN	more than 5 msec.
5	L-EJECT COMMAND IN	more than 5 msec.
6	L-STOP COMMAND IN	more than 5 msec.
7	L-PAUSE COMMAND IN	more than 5 msec.
8	L-REC COMMAND IN	more than 5 msec.
9	L-CUT IN COMMAND IN	more than 5 msec.
10	L-EDIT COMMAND IN	more than 5 msec.
11	L-CUT OUT COMMAND IN	more than 5 msec.
12	L-FF STATUS OUT	
13	L-FWD STATUS OUT	
14	L-REW STATUS OUT	
15	L-STANDBY STATUS OUT	
16	L-STOP STATUS OUT	
17	L-PAUSE STATUS 1 OUT	(dc)

18	L-REC STATUS OUT	
19	L-INSERT STATUS OUT	
20	L-VIDEO INSERT IN	
21	L-AUDIO 1 INSERT IN	
22	L-AUDIO 2 INSERT IN	
23	L-REVERSE COMMAND IN	(dc)
24	SPEED A IN	
25	SPEED B IN	
26	L-CTL PULSE OUT	
27	L-TACH OUT	
28	L-CAPSTAN OUT	
29	SYNCHRONIZE IN	
30	NC	
31	H-NORMAL FWD IN	
32	L-PAUSE STATUS 2 OUT	
33	L-SEARCH COMMAND IN	"L" level during shuttle or jog mode
34	NC	
35	GND	
36	GND	

### TBC

Pin	I/O Signal
A	EXT SYNC IN (X)
B	EXT SYNC IN (G) SC IN (G)
1	VIDEO OUT (X)
2	VIDEO OUT (G)
3	DT-V (X)
4	DT-V (G)
5	OFF TAPE
6	DOC PULSE (X)
7	DOC PULSE (G)
8	PLAY STATUS
9	NC
10	FH (X)
11	FH (G)
12	NORMAL/CONFI
13	SC IN (X)
14	MULTI CABLE CONNECT
15	DT ON
16	NC

## 2-6. CONNECTION CONNECTOR

When external cables are connected to the various connectors on the BVU-820 connector panel during the installation or the maintenance, hardwares as stated below or the equivalents must be used.

Panel Indication	Connection Connector
VIDEO IN EXT. SYNC IN SC IN VIDEO OUT 1 VIDEO OUT 2 RF (OFF TAPE)	1-560-069-11 PLUG, BNC, MALE
DUB IN	1-561-055-00 PLUG, 7P, FEMALE
DUB OUT	1-508-948-00 PLUG, 7P, MALE
AUDIO IN	1-508-084-00 CONNECTOR, 3P, MALE
AUDIO OUT	1-508-083-00 CONNECTOR, 3P, FEMALE
TIME CODE	1-506-311-00 PLUG, PIN
MONITOR	1-506-161-00 CONNECTOR, 8P, MALE
TBC	1-508-495-00 PLUG, 9P, MALE
REMOTE 2 (36P)	1-508-852-00 CONNECTOR, 36P, MALE
REMOTE 1 (9P)	1-560-651-00 PLUG, 9P (M) AND 1-561-749-00 JUNCTION SHELL, 9P

## 2-7. SELECT SWITCH SETTING

Along with the select switches on the control panel and the connector panel, the switches listed below are on the circuit boards. The functions of these switches on the circuit boards are described and the switches must be used according to systems and conditions.

### • SY-37 board

#### (i) SYNCHRONIZE sw. (Ref. No., S2-1)

In PREVIEW or AUTO EDIT mode, recorder will perform synchronization to the player by SEARCH mode between PREROLL-point and IN-point (VTR synchronization). This switch select either to use this function or not. Because synchronization will be performed by recorder, this switch of the player does not be effected.

ON: Perform synchronization.

(PREROLL TIME will be adjusted to 7 seconds automatically and PREROLL TIME switch will be nullified.)

OFF: No synchronization.

When the set is shipped, the SYNCHRONIZE sw is set to the OFF position.

#### (iii) PREROLL TIME sw. (Ref. No., S2-3)

Selects 5 seconds or 7 seconds for the preroll time at the editing.

ON: 5 seconds

OFF: 7 seconds

When the set is shipped, the PREROLL TIME switch is set to the ON position.

#### (iii) SEARCH DIAL sw. (Ref. No., S2-2)

There are two ways to set up the SHUTTLE mode from the PLAY mode.

(1) SEARCH dial is turned directly without pressing the SHUTTLE button in the PLAY mode.

(2) The SHUTTLE button is pressed in the PLAY mode.

The SEARCH DIAL switch selects above two system (1) or (2).

ON: system (1)

OFF: system (2)

When the set is shipped, the SEARCH DIAL switch is set to the ON position. When the BVU-820 is used as the playback machine (such as on air), it is recommended to use the second method (the switch is in the OFF position) to avoid accidental mode switching.

#### (iv) EIA/CCIR select sw. (Ref. No., S5)

Selects for EIA use or CCIR use for the TIMER DISPLAY.

For EIA use: Switch 1 is only OFF position, the other switches are ON position.

For CCIR use: All the switches are ON position.

When the set is shipped, the EIA/CCIR select switch is set to the EIA position.

#### (v) KEY select sw. (Ref. No., S3)

The function of BVU-820 can be controlled by either control panel of unit or optional control panel (BK801). However, to connect both control panel two of 40 pin flat cable connectors were equipped on SY-37 board.

This switch select one function control panel from above two.

This switch positioned to front: CN31 is selected.

This switch positioned to back: CN32 is selected.

When the set is shipped, the KEY switch is set to the CN31 is selected position.

#### (vi) CTL Indicator (Time counter) function select sw. during time code mode. (Ref. No., S5-3)

Selects CTL data display or Time Code data display in Time Code mode.

(1) When BVU-820 is used in Time Code mode or Auto mode with TC-20 board or optional Time Code Generator/Reader (BK806), the CTL data is indicated on the indicator by pressing the **LAP** button on the function of BVU-820 twice in 0.6 seconds. Still the Time Code data controls the VTR.

(2) In the above mode (CTL data display mode) when the **LAP** button is pressed twice again in 0.6 seconds, the indicator will be changed to indicate the Time Code data. CTL data display can be changed to time code display by selecting from player Local mode to Remote mode and by pressing RECORDER select button on the front panel of the BVU-820.

(3) When editing a recorded tape that has no Time Code signal recording, the Time Code data is reset by pressing the **RESET** button.

(4) When the tape is ejected, the Time Code data and the CTL data are not reset automatically. Press the **RESET** button and these data will be reset.

(5) In the case of Data communication between two sets (9 pin, RS422), the indicator of Player BVU-820 machine remains same as indication, before ROMs update.

For CTL Indicator in Time Code mode, set this switch to OFF.

Except above mode, set this switch to ON.

When the set is shipped, this switch is set to the ON position.

(vii) **AUDIO/VIDEO Edit Timing Difference Compensation sw.** (Ref. No., S5-4)

This switch can compensate for the timing difference of editing points of Audio and Video in Auto editing mode or Assembly editing mode. Also this switch is controlled by ROMs of version 8.

In order to compensate for the timing difference of editing point, perform the following procedure.

- (1) Select the "Edit command timing switch" which is installed on optional unit such as BVE-800 and BVE-3000 etc.

Select to "-3" frames.

(2) **Conditions**

1. When the editor is used to editing, use the editor that is equipped with "Edit command timing switch", such as BVE-800, BVE-1000, BVE-3000A and BVE-5000.
2. Controlled by 9 pin (RS422).
3. Audio cut-in point will have double recording in 2 frame period.

To compensate for the timing difference of Audio and Video, set this switch to OFF.

If not compensating, set this switch to ON.

When the set is shipped, this switch is set to the ON position.

(viii) **DTR-2000 Select sw.** (Ref. No., S5-5)

When connecting with DTR-2000 and assembly editing is done, set this switch to OFF.

(The previous recorded time codes are read and the relative next time codes is recorded at the editing point so that the consecutive time codes are recorded on the tape.)

When remote control (BVE-800 or etc.) other than DTR-2000 is connected, set this switch to ON.

When the set is shipped, this switch is set to the ON position.

● **CD-18 board**

(i) **SHARPNESS sw.** (Ref. No., S1)

Is used to increase the signal to noise ratio when needed.

ON: SHARP (Sharpness of a picture is maintained.)

OFF: Signal to noise ratio is increased.

When the set is shipped, the SHARPNESS switch is set to the ON position.

Note that the SHARPNESS switch must be in the ON position (SHARP) in the normal operation of the BVU-820.

(ii) **APC sw.** (Ref. No., S2)

Expands the lock range of the APC for obtaining a colored picture when the BVU-820 plays back a tape dubbed on a VTR without the capstan servo and playback picture is not colored due to abnormal APC fluctuation.

ON: WIDE (The lock range of the APC is widened purposely.)

OFF: NORMAL

When the set is shipped, the APC switch is set to the OFF position. When this switch is set to the ON position (WIDE) in the SHUTTLE/JOG mode, sometimes color does not appear.

For the normal operation, the switch must be in the OFF position (NORMAL).

● **MD-15 board**

(i) **LINE DUB sw.** (Ref. No., S1)

Selects editing systems.

ON: The system is designed with the BVU-200 (excluding the BVU-200A and BVU-200B) as the player and the BVU-820 as the recorder for the dubbing by the LINE signal.

OFF: The system other than the above.

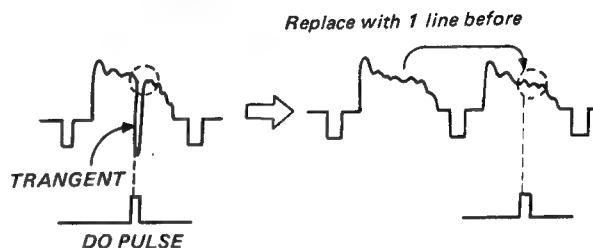
When the set is shipped, the LINE DUB switch is set to the OFF position.

● **YD-10 board** (Serial No. 10351 and higher)

(i) **VIDEO DROP OUT DETECTOR ENABLE sw.** (Ref. No., S1)

When this switch set to on, "Video Drop Out Detector" which detect negative transient noise under pedestal level, trigger D.O.C. circuit to replace the noise part with one line before. If this compensation is needed such as microwave transmission without TBC, this switch should be ON.

Factory Set: OFF



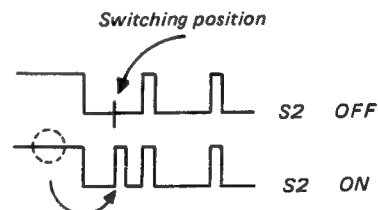
(ii) **SWITCHING NOISE SUPPRESSOR ENABLE sw.** (Ref. No., S2)

This switch enables "Switching Noise Suppressor". But, in case following conditioned tape (abnormally recorded), will be reproduced, this switch should be set to off.

Condition: Head switching points located in the vertical Sync.

Reason: Normally, Switching Noise Suppressor detect switching points and trigger DOC circuit to replace a part with one line before. However, if switching point located in the 1st line in vertical sync, switching noise part which is sync tip level, will be replaced with pedestal level, and causing positive pulse will be inserted in vertical sync as shown below.

Factory Set: ON



## 2-8. RACK MOUNTING

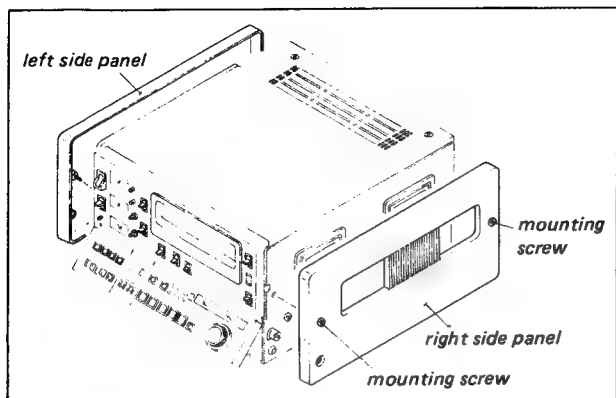
The BVU-820 can be mounted in the 19-inch standard rack. It is recommended to use the PACK MOUNT KIT, BK805, optional part (including the slide rails and the handle brackets) or the following ACCURIDE'S slide rail.

RACK-MOUNT SLIDES MODEL 305

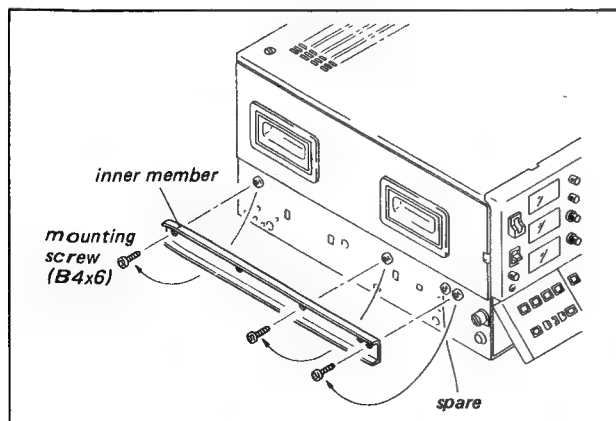
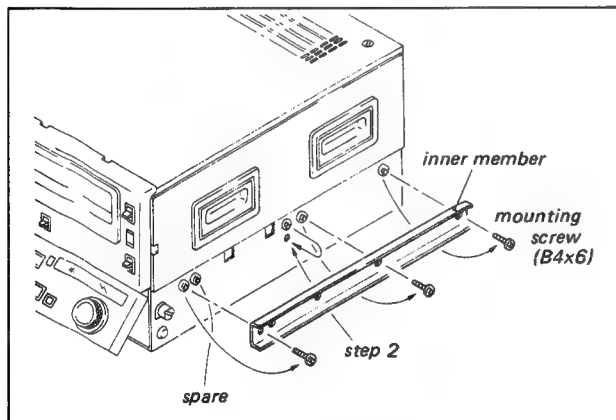
SLIDE LENGTH 22 INCH

1. Loosen two mounting screws on the right and the left side panels.

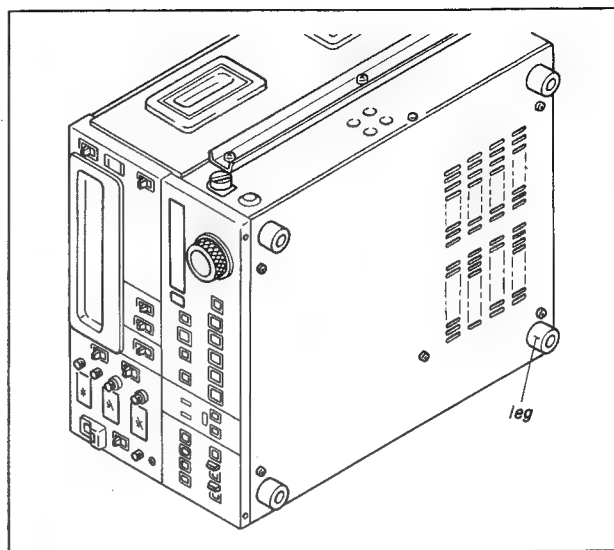
- Mounting screws will not be detached since it uses a re-tainer on the inside the cover.



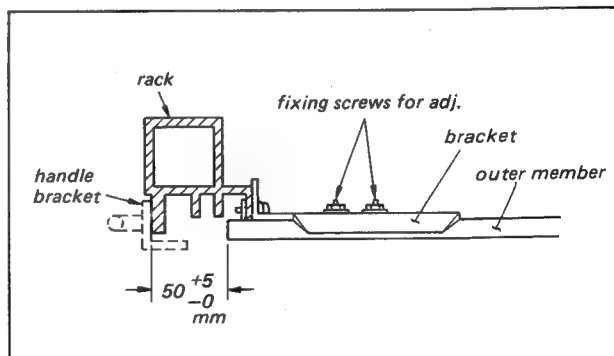
2. Remove a mounting screw on the chassis (R) as shown in figure, and thread the mounting screw to a lower hole.
3. Remove the each four mounting screws on the (R) chassis and the (L) chassis.
4. Attach the inner members of the slide rails to the (R) chassis and the (L) chassis with the screws removed in step (3).
  - Length of the screws used for the attachment is limited. If the screws supplied with the chassis are lost, a screw 6 mm in length (B4x6) must be used.
  - The inner member must be fixed at three points with the screws.



5. Remove four legs located under the set.
  - If the set is mounted in the rack without removing the legs. It will contact the lower set and the upper set cannot be pulled out from the rack.

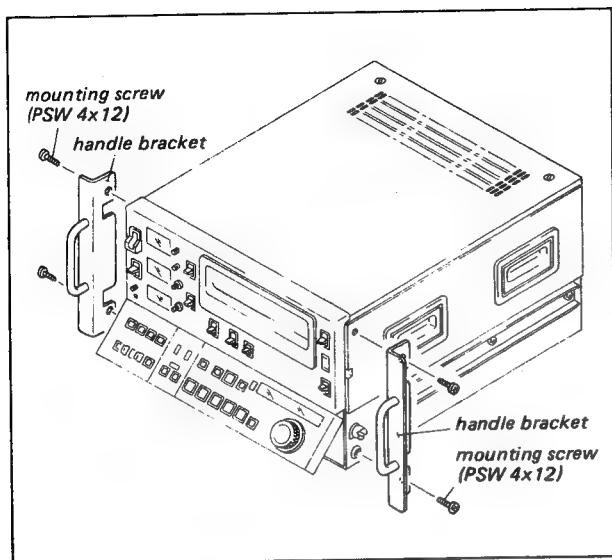


6. Attach the outer member bracket of the slide rail to the rack and position from the edge of the slide rail to the outside of the rack so that the position satisfies to the specified value.



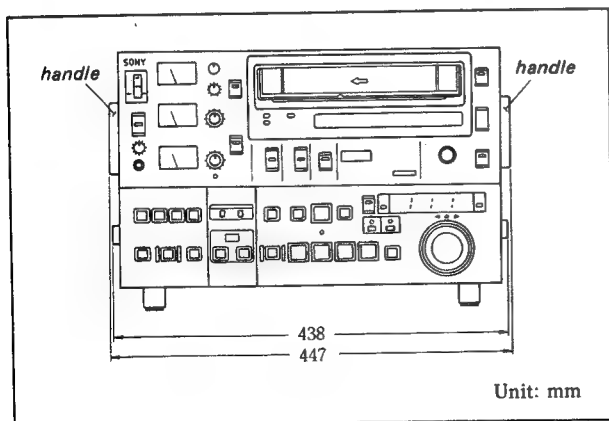


7. Attach the handle brackets.



**NOTE:**

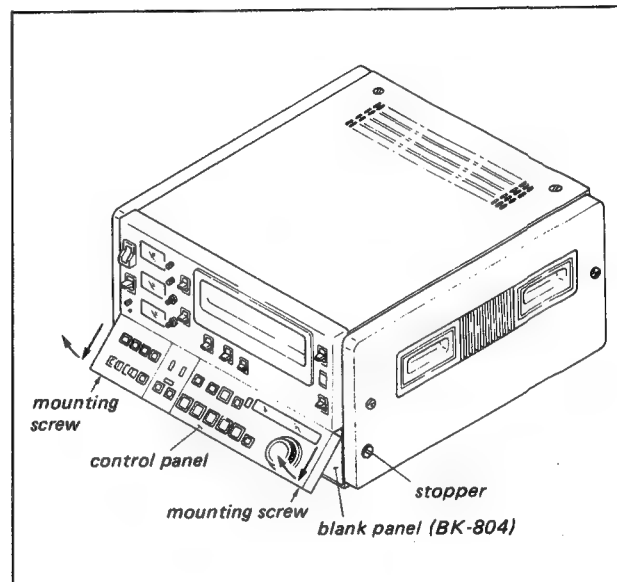
1. Six sets of the BVU-820 can be mounted on the 19-inch EIA standard rack.  
When the several sets are mounted on the rack, it is recommended to install the fan for ventilation. Good air circulation is essential to prevent internal heat buildup in the rack. 5°C to 40°C environmental condition must be met throughout all units.
2. Be sure to stabilize the rack to the floor to avoid the accidents when the BVU-820 is pulled out.
3. Dimension without side panels are shown in figure.  
If the rack front width is narrower than the set width, the set must be mounted after the handles on the right and left made been removed.



**2-9. CONTROL PANEL UNIT REMOVAL**

When the control panel unit is removed to be used as the remote control unit, perform the following steps.

1. Loosen the control panel stopper on the right and the left side panels. Open the control panel.

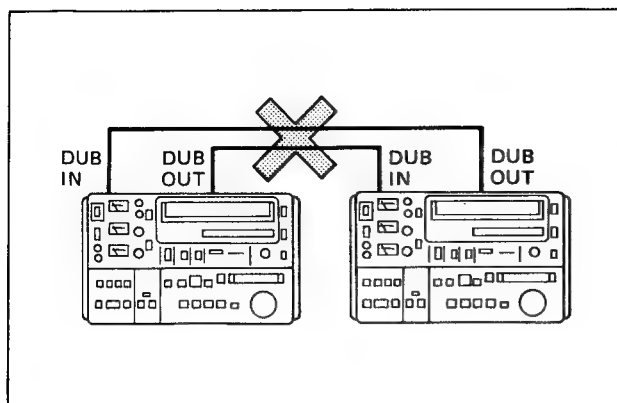


2. Remove two mounting screws as shown in figure and move the control panel unit in the direction shown by the arrows for removal.
3. Remove the flat cable on the rear side of the control panel.
4. Connect the optional flat cable (5 m), BK802.  
(Refer to sec. 2-11.)
5. Attach the optional blank panel, BK804.

**2-10. SUPPLIED ACCESSORY**

Supplied BVU-820 accessories are as follows.

1. AC Power Cord
2. Dubbing Cable (VDC-5)  
This cable is utilized when the tape to tape editing and dubbing are used with using the dubbing cable. (length: 5 m)  
Only the video signal can be transmitted by this cable and the audio signal does not. For the audio signals the different cables are required.



3. **9 Pin Remote Control Cable**  
This cable is used for the remote control from one BVU-820 as a recorder to the other BVU-820 as a player when the two sets of the BVU-820 are used for the tape to tape editing and dubbing.
4. **Extension Board (EX-7)**  
The BVU-820 main circuit board is a plug-in type which is easy to remove of install. Extension board, EX-7 is used for check and maintenance of the main board. It is more than adequate with supplied extension board. However, if it is required to have additional boards, it can be obtained through service organization.

## 2-11. OPTIONAL ACCESSORY

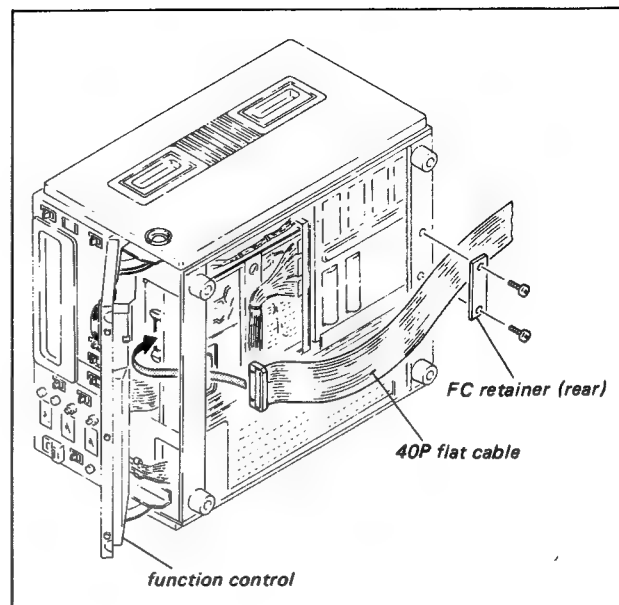
The followings are provided as the optional accessory.  
The suitable accessory should be used for each system.

1. **Control Panel (BK801)**  
When the BVU-820 is operated from the remote place, the function control panel of the BVU-820 can be separated and functioned as the remote controller. And also the other remote controller (BK801) is provided as the optional accessory. The BK801 includes the control panel and 40P flat cable which connects the control panel to the BVU-820.
2. **40P Flat Cable (BK802)**  
40P flat cable is used for connecting the control panel to the BVU-820, when the control panel unit is separated from the BVU-820 and used as the remote controller.  
This cable length is 5 m, however in case that the different cable is required, the following cable are recommended.  
Produced by 3M  
3517 Series  
#28 AWG Stranded  
Jacketed/Shielded Flat Cable  
.050" (1.27 mm) Center Spacing  
Number of Conductors: 40

The flat cable can be extended up to maximum 10 m (in no interference condition such as an electrical noise).

Installation:

1. Open the function control panel.
2. Remove the bottom plate and FC retainer (rear).
3. Install the 40P flat cable as shown in figure.



3. **Control Panel Case (BK803)**  
The BK803 control panel case is the optional unit which houses the remote control panel dismantled from the BVU-820.
4. **Blank Panel (BK804)**  
The BK804 blank panel is the plate which covers the block of BVU-820 resulted in empty by removing the control panel.
5. **Rack Mount Kit (BK805)**  
The BK805 rack mount kit is used for mounting the BVU-800 on the 19-inch EIA standard rack. This mounting kit consists of two slide-rails and two handle-brackets.
6. **Time Code Generator/Reader (BK806)**  
The BK806 is a time code generator/reader to make time code editing for a BVU-820.
7. **Function Panel Rear Cover (BK811)**  
The BK811 function panel rear cover is the plate which covers the rear side of the function control when the control panel is tilted.
8. **9-Pin Remote Control Cable (RCC-5G, RCC-10G, RCC-30G)**  
Three kinds of 9-pin remote control cable are provided.

Type	Length
RCC-5G:	5 m
RCC-10G:	10 m
RCC-30G:	30 m

This remote cable connects the 9-pin remote connector on the connector panel to the BVU-820.

**NOTE:** The remote cable can be extended up to 1200m.

## SECTION 3

### TECHNICAL INFORMATION

#### 3-1. SPECIFICATIONS

##### GENERAL:

###### MECHANICAL:

**Weight:** 38 kg (83 lb 12 oz)  
**Dimensions:** 454 x 283 x 550 mm (17 7/8 x 11 1/4 x 21 3/4 inches) (w/h/d)  
**Tape transport mechanism:** U-matic system (3/4 inch cassettes)  
**Tape speed:** 9.53 cm/s  
**Wow/flutter:** less than 0.2% rms  
**Record/playback time:** Maximum of 60 min. with type KCA-60 video cassette  
**Fast forward time:** Less than 4 min. with type KCA-60 video cassette  
**Rewind time:** Less than 2.5 min. with type KCA-60 video cassette  
**Search speed:** SHUTTLE:  
 DT SELECT switch:  
 SEARCH or OFF position  
 Still, 1/30, 1/10, 1/5, 1/2, 1, 2, 5, and 10 times normal in forward and reverse direction  
 DT SELECT switch:VAR position  
 1 time in reverse direction to 3 times in forward direction.  
**JOG:**  
 Still to 1 (8 steps) in forward and reverse direction

###### CONNECTORS:

**AC IN:** 3-pin AC connector  
**VIDEO IN x2:** BNC connectors  
**VIDEO OUT x2:** BNC connectors  
**AUDIO IN CH-1/CH-2:** XLR female connectors  
**AUDIO OUT CH-1/CH-2:** XLR male connectors  
**AUDIO OUT MONITOR:** XLR male connectors  
**TIME CODE IN:** RCA phono jack  
**TIME CODE OUT:** RCA phono jack  
**DUB IN:** 7-pin male connector  
**DUB OUT:** 7-pin female connector  
**SC IN:** BNC connector  
**EXT SYNC IN:** BNC connector  
**RF OUT (OFF TAPE):** BNC connector  
**TBC:** CCY connector  
**MONITOR OUT:** 8-pin connector  
**REMOTE (36-p):** 36-pin connector  
**REMOTE (9-p):** RS-422 9-pin connector  
**HEADPHONES:** JM-60 headphones binaural jack  
**Operating temperature:** +5°C to +40°C  
**Storage temperature:** -20°C to +60°C

###### ELECTRICAL:

**Power requirements:** AC 100/120/220/240V  $\pm$  10% (Selectable) 48 to 64 Hz  
**Power consumption:** 170W  
**Editing functions:** ASSEMBLE and INSERT (VIDEO, AUDIO CH-1, AUDIO CH-2)  
 AUTO EDIT, MANUAL EDIT  
 PREVIEW, REVIEW, PREROLL, TRIM

###### VIDEO:

**Video recording system:** Luminance: FM  
 Chroma: SC low-range conversion  
**Input:** NTSC composite video, sync negative 1.0 Vp-p  $\pm$  0.5 V 75 $\Omega$ , unbalanced  
**Output:** NTSC composite video, sync negative 1.0 Vp-p  $\pm$  0.2 V, 75 $\Omega$ , unbalanced

**Dubbing input:** Luminance signal:  
 1.7 Vp-p  $\pm$  0.2 Vp-p  
 Sync negative,  
 Impedance: 500 $\Omega$   $\pm$  10%  
 Chroma signal:  
 0.9 Vp-p  $\pm$  0.1 V,  
 Impedance: 1 k $\Omega$   $\pm$  10%

**Dubbing output:** Luminance signal:  
 1.7 Vp-p  $\pm$  0.2 Vp-p  
 Sync negative,  
 Impedance: 500 $\Omega$   $\pm$  10%  
 Chroma signal:  
 0.9 Vp-p  $\pm$  0.1 Vp-p  
 Impedance: 1 k $\Omega$   $\pm$  10%

**Horizontal resolution:** 340 lines (monochrome mode)  
 260 lines (color mode)

**Signal to noise ratio:** More than 49 dB (monochrome mode when the sharpness switch is set to ON)  
 More than 47 dB (color mode when the sharpness switch is set to ON)  
 More than 51 dB (monochrome mode when the sharpness switch is set to OFF)  
 More than 49 dB (color mode when the sharpness switch is set to OFF)

###### AUDIO:

**Input:** (MIC)  
 -60 dB, 3 k-ohms, balanced (matches 600 ohm microphones)  
 (LINE)  
 +4 dB, 10 k-ohms/600ohms, balanced

**Output:** (LINE)  
 +4 dB, low impedance, balanced (600 ohm load permissible)  
 (HEADPHONES)  
 -46 to -26 dB, 8 ohms load, binaural  
 (MONITOR)  
 +4 dB, 600 ohm load, balanced

**Distortion:** Less than 2.0% (1 kHz reference level)

**Frequency response:** 50 Hz to 15 kHz

**Signal to noise ratio:** 48 dB (at 3% distortion level)

###### TIME CODE

**Input:** 0 dB  $\pm$  6 dB, 10 k-ohms unbalanced (0 dB = 1.55 Vp-p pulse)

**Output:** 0 dB  $\pm$  3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)

###### SC

**Input:** 2 Vp-p  $\pm$  1 V, 75 ohms, unbalanced

###### SYNC

**Input:** 0.2 Vp-p to 5 Vp-p, negative, 75 ohms, unbalanced (1 Vp-p  $\pm$  0.2 V with VIDEO input)

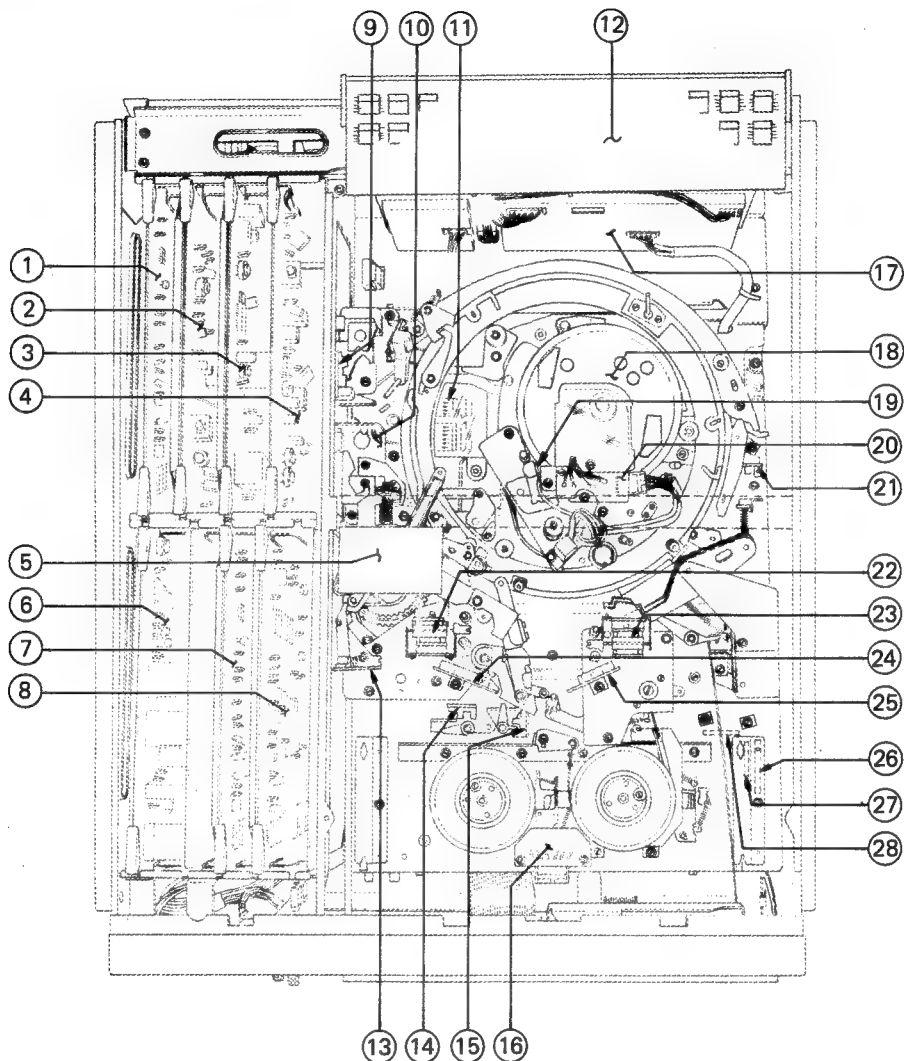
###### RF output (OFF TAPE):

0.5 Vp-p  $\pm$  0.1 V, 75 ohms, unbalanced

## 3-2. LOCATION OF MAIN PARTS

### 3-2-1. Location of the Printed Circuit Boards

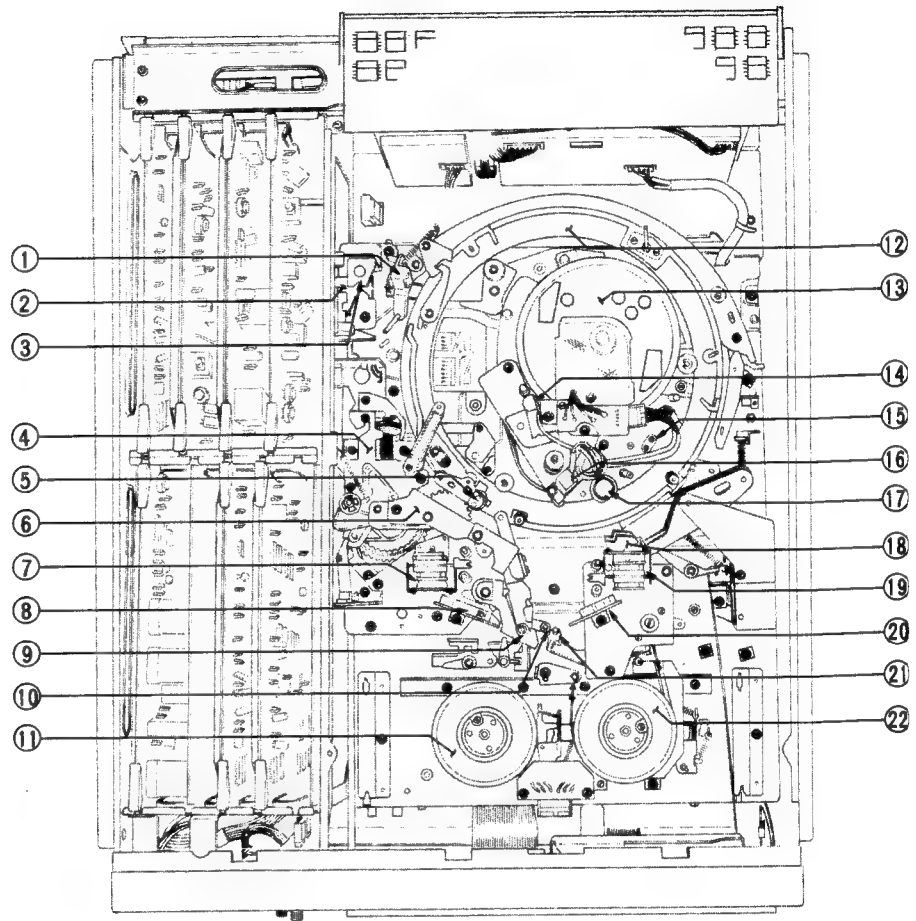
< TOP VIEW >



- |                  |  |
|------------------|--|
| ① TC-13 BOARD    | ⑮ PC-7 (A) BOARD                             |
| ② CD-18 BOARD    | ⑯ EM-1 BOARD                                 |
| ③ YD-10 BOARD    | ⑰ RP-10 BOARD                                |
| ④ MD-15 BOARD    | ⑱ DA-6 BOARD                                 |
| ⑤ FC-10 BOARD    | ⑲ TC-12 BOARD                                |
| ⑥ AU-13 BOARD    | ⑳ SR-17 BOARD                                |
| ⑦ RS-3 BOARD     | ㉑ EK-2 (B) BOARD                             |
| ⑧ SV-24 BOARD    | ㉒ TAKE-UP SIDE TENSION DETECTOR              |
| ⑨ EK-3 BOARD     | ㉓ SUPPLY SIDE TENSION DETECTOR               |
| ⑩ TM-8 BOARD     | ㉔ PC-12 BOARD                                |
| ⑪ TM-4 BOARD     | ㉕ PC-8 BOARD                                 |
| ⑫ DT-3 BOARD     | ㉖ CC-9 BOARD (with Cassette-up Compartment)  |
| ⑬ EK-2 (A) BOARD | ㉗ CC-11 BOARD (with Cassette-up Compartment) |
| ⑭ PC-7 (B) BOARD | ㉘ CC-10 BOARD (with Cassette-up Compartment) |

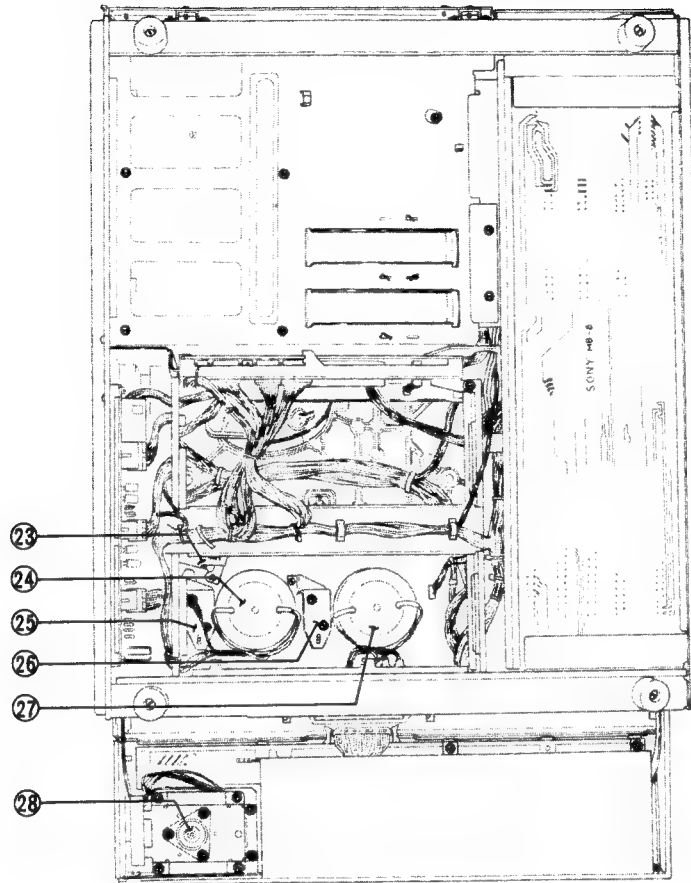
### 3-2-2. Location of the Mechanical Main Parts/Components

< TOP VIEW >



- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| ① Threading Slider                    | ⑫ Threading Ring                     |
| ② Thread End 1 Block                  | ⑬ Head Drum                          |
| ③ Threading V Shaped Block            | ⑭ Time Code Head                     |
| ④ Threading Gear Block                | ⑮ Audio/CTL Head                     |
| ⑤ Pinch Roller                        | ⑯ Full Erase Head                    |
| ⑥ Threading Arm                       | ⑰ Capstan Shaft                      |
| ⑦ Take-up Side Tension Detector Block | ⑱ Pinch Lever                        |
| ⑧ Tape Beginning Detector Block       | ⑲ Supply Side Tension Detector Block |
| ⑨ Threading Guide                     | ⑳ Tape End Detector Block            |
| ⑩ Take-up Tension Arm                 | ㉑ Supply Tension Regulator Arm       |
| ⑪ Take-up Reel Table                  | ㉒ Supply Reel Table                  |

< BOTTOM VIEW >



- ②③ S Tension Solenoid Block
- ②④ Supply Reel Motor
- ②⑤ Supply Reel Brake Solenoid Block
- ②⑥ Take-up Reel Brake Solenoid Block
- ②⑦ Take-up Reel Motor
- ②⑧ Search Dial Block

### 3-3. PRINTED CIRCUIT BOARDS

The circuit board information is provided below.

System	Circuit board	Circuit function
VIDEO	MD-15	• Luminance and chrominance signal modulator.
	RP-10	• REC/PB amplifier • Rotary erase amplifier
	DA-6	• DT head amplifier
	YD-10	• Luminance signal demodulator
	CD-18	• Chrominance signal demodulator
AUDIO	AU-13	• REC/PB amplifier • Audio system control
	AU-25	• Bias oscillator • CH-1/CH-2 erase oscillator
	SA-9	• Input impedance converter (high $\leftrightarrow$ low)
	AO-2	• Audio monitor switch
	AO-3	• CH-1/CH-2 output amplifier • Monitor out selector/output amplifier
	HP-5	• Headphones level adj.
SERVO	SV-24	• Capstan/drum speed and phase servo
	CF-8	• CTL REC/PB amplifier
	RS-3 (RS-4)	• Tape tension detector • Reel motor driver control
	EM-1	• Reel rotation detector
	MD-15	• Blanking switcher
	FC-10	• When the set is put into the TBC mode and DT mode simultaneously, this circuit delays the switching pulse.
DYNAMIC TRACKING	DT-3	• Dynamic tracking
TIME CODE	TC-13	• Time code REC/PB amplifier • Automatic reference sync selector (for servo) • CTL counter (for display)
SYSTEM CONTROL	SY-36 or SY-92	• Function control
	SY-37	• System control micro processor
	SY-71	• Cassette compartment motor driver • Threading motor driver • Skew solenoid driver • Pinch solenoid driver • T brake solenoid driver • S brake solenoid driver • S tension regulator solenoid driver • Humidity detector
	KY-9 (KY-14)	• Key board with serial data $\leftrightarrow$ parallel data converter
	DP-9	• Display
	PC-9	• Search dial
	PC-14	• Search dial

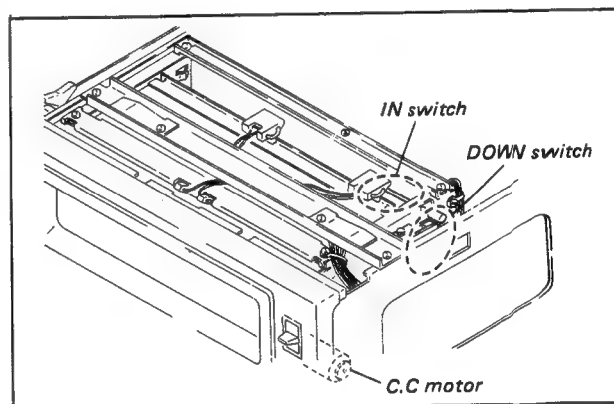
POWER DRIVER	PD-19 (PD-15, PD-17) (DR-9, DR-19)	• Full erase oscillator • 12 V regulator • 5 V regulator • -12 V regulator • Drum motor power driver • Capstan motor power driver • Reel motor power driver • Dynamic tracking driver
POWER SUPPLY	PW-50	• Power supply
	PW-79	• Switching regulator
	FU-13	• Fuse

### 3-4. MECHANICAL OPERATION

#### 3-4-1. Cassette-in/Cassette-out Operation

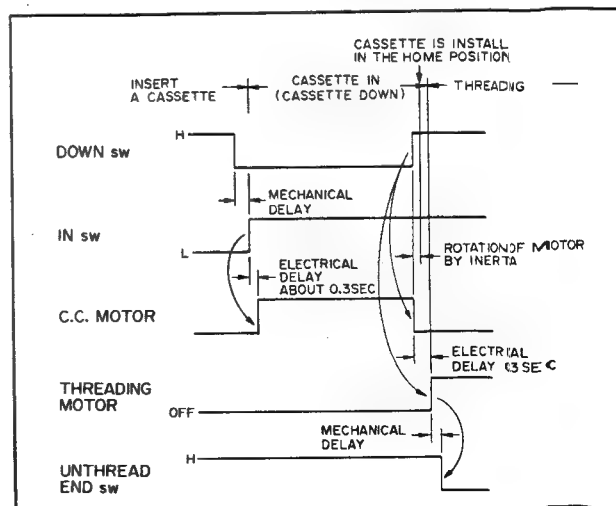
The cassette insertion system in the BVU-820 is a front access system. The cassette compartment drops automatically after the cassette tape has been inserted into the cassette compartment and threading action is started after the cassette is seated in the home position.

The timing chart of the photoelectric sensor and the motor are as follows:



#### (1) Cassette-in Operation

The timing of the Cassette Down switch (DOWN switch), the Cassette-in switch (IN switch), the Cassette Compartment motor (C.C. motor), the Threading motor, and the Unthreading End switch in the cassette-in operation are as follows:

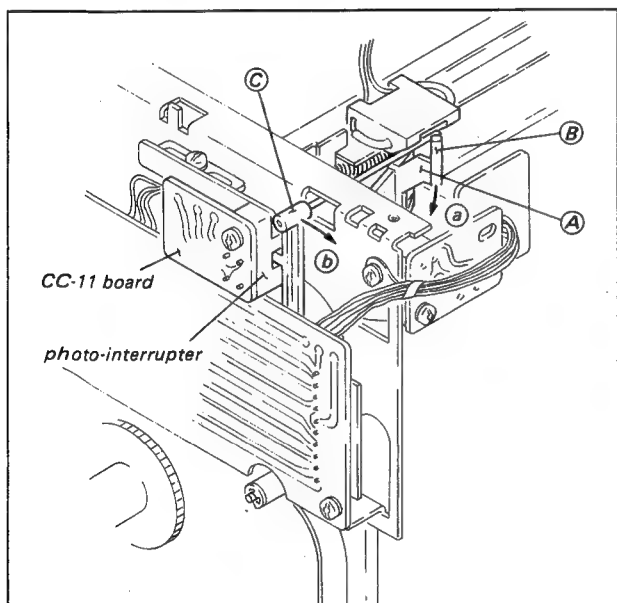


- The DOWN switch and the IN switch are turned to "H" or "L" in the manner stated below and the C.C. motor operate as follows:

(i) DOWN switch

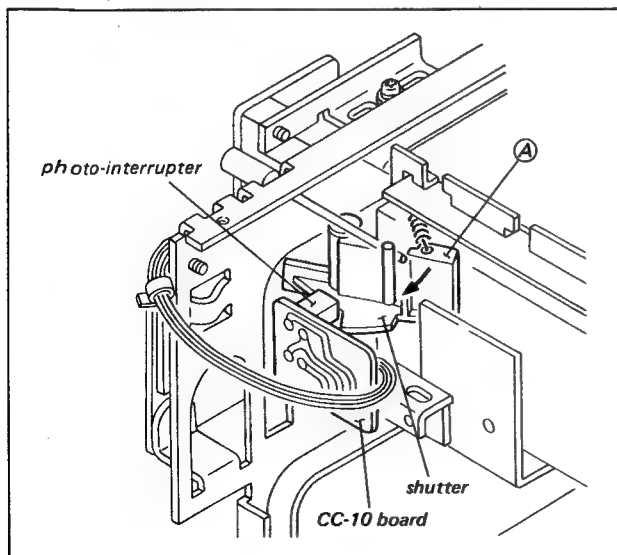
The cassette tape is inserted by hand and then the cassette pushing lever (called **(A)** for making the sentence simple) moves in the direction indicated by arrow **(a)**. The down switch arm (called **(C)**) which has been held by the pin (called **(B)**) of the **(A)** moves in the direction shown by arrow **(b)** with the movement of **(A)**, and the shutter of **(C)** opens the photo-interrupter on the CC-11 board.

Then the DOWN switch turns to "L".



(ii) IN switch

The cassette tape is inserted by hand further after the DOWN switch operates (until the cassette is stopped). The **(A)** shutter covers the photo-interrupter on the CC-10 board and the IN switch turns to "H".



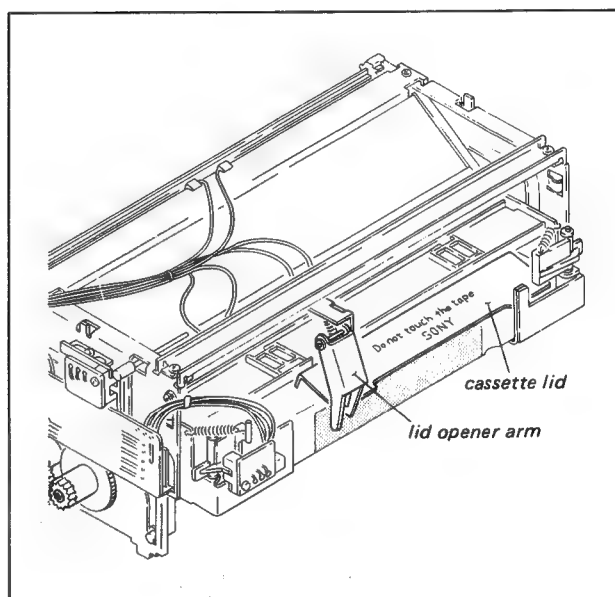
(iii) C.C. motor

When the IN switch turns to "H" after the cassette insertion, about 11.3V from the SY-71 board is impressed on the C.C. motor via the CC-9 board and the motor starts. The power of the motor moves the cassette compartment through the belt and the gears.

(iv) Cassette tape lid opener

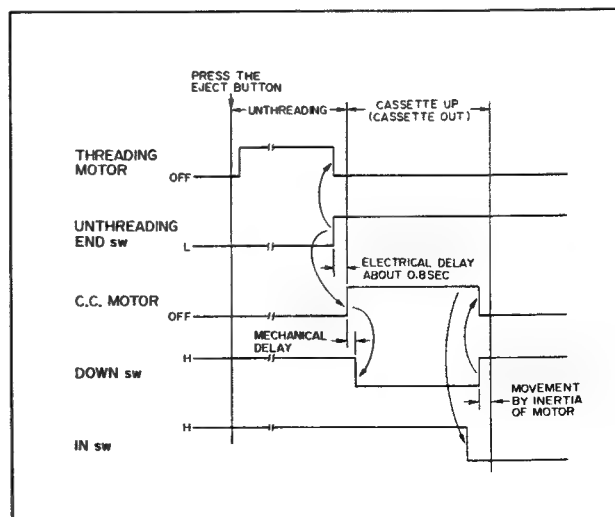
When the cassette tape is inserted, the C.C. motor rotates, and the cassette compartment moves.

The lid opener arm holds the bottom section of the cassette lid at the point where the horizontal movement of the cassette compartment changes to the vertical movement. The lid is opened following with the downward movement of the cassette compartment.



(2) EJECT Operation

The timing of the Threading motor, the Unthreading End switch, the C.C. motor, and the IN switch in the eject operation are as follows:





## (3) Protection Circuit

- (i) If the cassette tape is removed forcibly when the cassette tape is dropping, the IN switch turns to "L", puts the machine into the EJECT mode, the C.C. motor rotation is reversed, and the cassette-up operation takes place.
- (ii) If the cassette tape after the cassette-up is pushed in by hand forcibly in the rear direction, the C.C. motor rotates 5 seconds in reverse direction after the cassette-up and the cassette-down operation take place again (for preventing the C.C. motor from burning). And if the drop and rise time of the cassette compartment takes more than about 5 seconds, it is assumed that the cassette compartment is blocked by something and the motor rotation is stopped.
- (iii) The motor drive circuit operates only about 2 seconds in the cassette-up or the cassette-down operation.

## 3-4-2. Threading and Unthreading Operation

The cassette compartment drops automatically after the cassette tape is inserted into the cassette compartment.

When the cassette tape is placed into the home position, the threading arm moves, and the tape will be drawn out from the cassette. At this point, the threading arm moves to thread the tape around the drum.

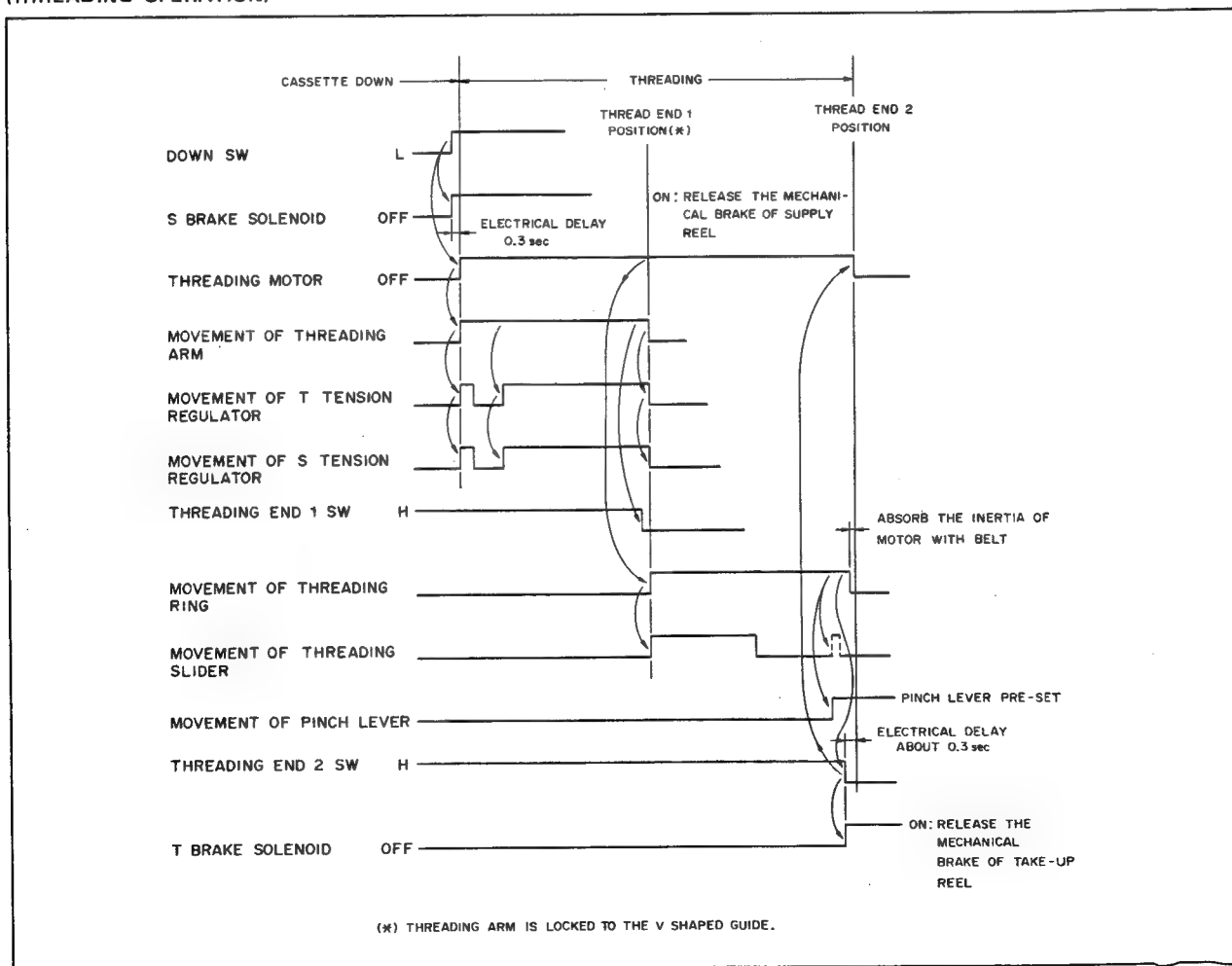
In the threading operation, the tape is drawn from the supply reel. In the unthreading operation, the tape is rewound onto the supply reel (when the set condition is normal), but the tape is taken up by the take-up reel when the set is in the states as mentioned below.

- When the power is turned ON while the tape is threaded, all condition will wake up as tape being threaded. (When the power is turned ON, the set goes through unthreading motion and then the threads again.)
- When the AUTO-OFF lamp turns ON. (Condensation is caused on the head drum.) (The set is forcibly placed into the EJECT mode.)
- When the tape tension detector detects a slacken tape or an excessively high tension. (In the tape protection mode.) (In the threading completion state (it is called threading end mode), the set is placed into the STOP mode once and, if the tape protection signal exists for more than 2 seconds in the STOP mode, the EJECT mode is set up forcibly. When the tape protection signal is generated in the threading or the unthreading mode, the set is placed into the EJECT mode.)

## (1) Threading Operation

The operational timing of the electronic switches, the motor, and the ring are shown below.

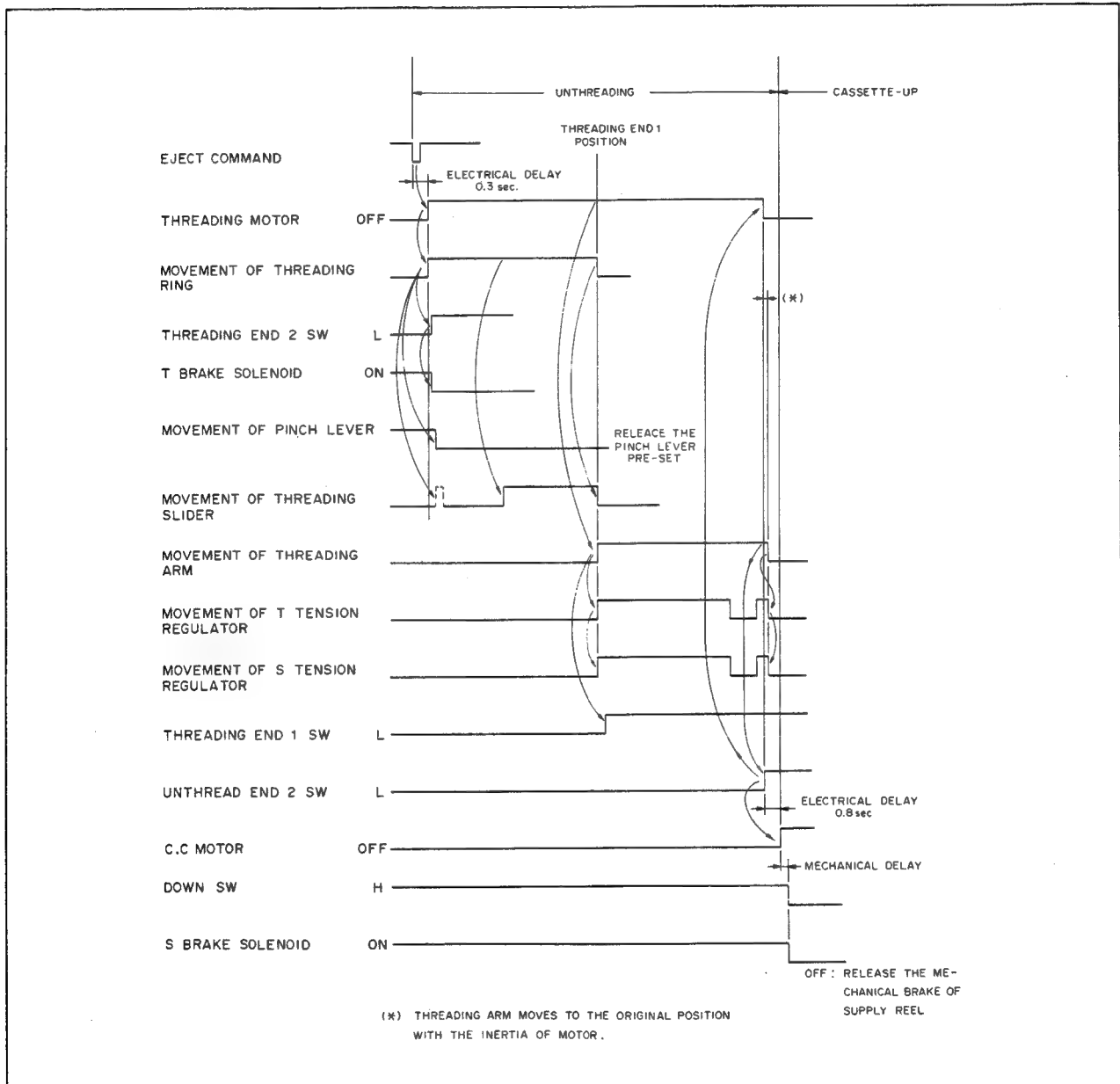
## (THREADING OPERATION)



(2) Unthreading Operation

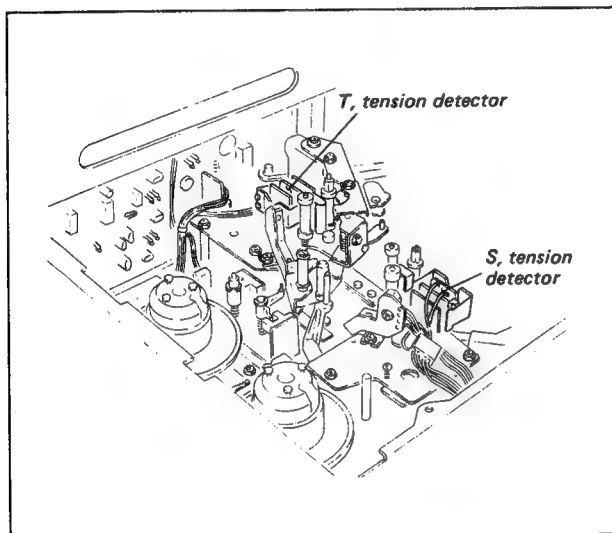
The operational timing of the electronic switches, the motor, the tape guide, and the ring are as follows. If the THREADING DISABLE or TAPE PROTECTION signal is generated, the eject operation is stopped.

(UNTHREADING OPERATION)



### 3-4-3. Electrical Tape Tension Detector

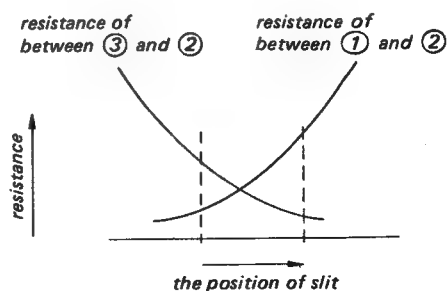
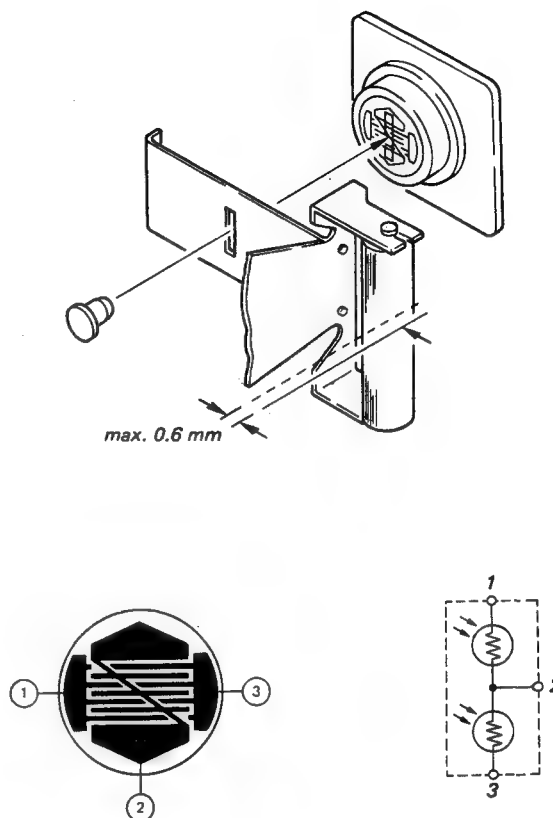
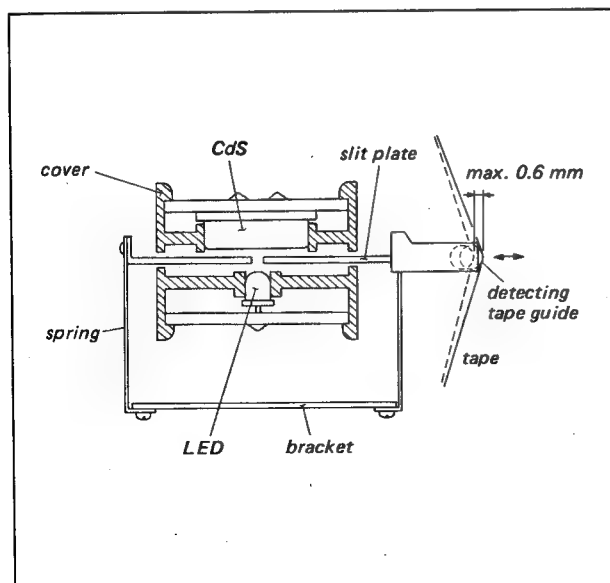
The BVU-820 has two tension detectors. One is placed near the tape entrance side of the cassette tape and the other near the exit for providing an optimum tape tension. The fundamental mechanism of the tension detector is as follows.



#### (1) Fundamental Mechanism

The fundamental mechanism of the tension detector is shown in the figure. The light emitted by an LED is received by the CdS detection element through a slit on the slit plate connected directly to the tape guide. The electrode's pattern of this CdS is shown in the figure. The slit moves with the tape tension change and the point where the light reflector moves. Then the resistance values between ① - ② and the resistance between ③ - ② are vary. The tape tension around the tension detector tape guide is detected by the resistance variation.

This resistance variation output controls the reel motor torque, and the tape tension is controlled.



(2) Actual Operation

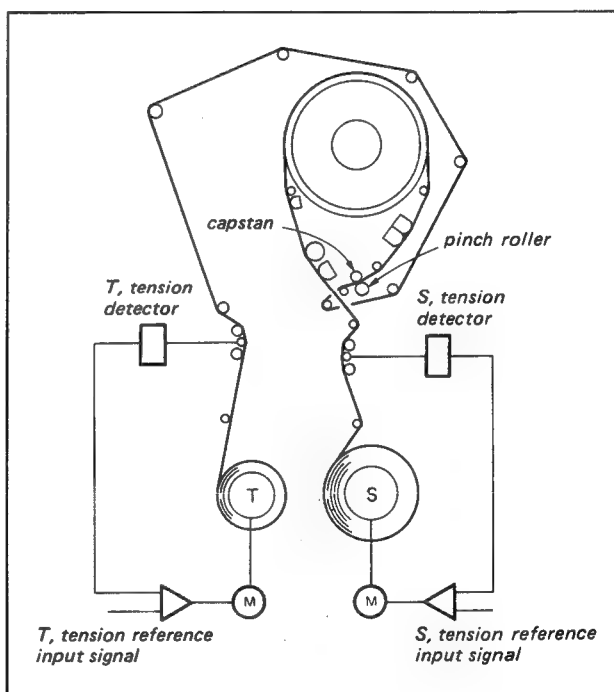
The movable distance of the tape guide directly connected to the slit plate is adjusted with the stopper from 0 to 0.6 mm. The 0 point and the sensitivity of the detecting operation are set with variable resistors on the RS-4 board. The tape tension, when the tape guide moves about 0.6 mm, corresponds to about 300 grams. If 43 grams or more tension is applied on the supply side tension detector in the F-FWD mode, 43 grams or more tension on the take-up side tension detector in the REW mode, on 255 grams or more tension is applied on the supply side and the take-up side tension detectors in the modes other than the above, the BVU-820 considers to have abnormal tension and will go into the stop mode to protect the tape.

On the other hand, when the tension applied on the tape is less than 8 grams, it is regarded to have a tape slack and the auto stop mode is set up in any mode for the tape protection.

3-4.4. FWD, REV, SHUTTLE, JOG Operation

(1) Tension Servo System

The tension servo loops shown in the figure function independently for the supply and the take-up motor in the FWD (excepting the modes set up by pressing the PLAY button, i.e., the REC mode and the x1 SPEED PLAY mode), REV, SHUTTLE, JOG, STILL and the STOP mode. Thus the tape tensions on the supply and the take-up side are controlled to the optimum conditions at the all time. The tape tension on the supply side is controlled by the mechanical tension control mechanism comprised from the tension arm, the brake band, and the supply reel table in the modes set up by the PLAY button, that is, in the REC mode and the x1 SPEED PLAY mode. In this case, the power is not supplied to the supply reel motor. The tape tension on the take-up side in the REC mode and the x1 SPEED PLAY mode is controlled to optimum condition by the tension servo loop as well as in the FWD (excepting the REC and the x1 SPEED PLAY mode), REV, SHUTTLE, JOG, STILL, and the STOP mode.



(2) Timing Chart

The timing of the S tension solenoid, pinch solenoid, and the rotation of the capstan motor in the FWD, REV, SHUTTLE, and the JOG mode are shown below. There are two method for the mode switching from the PLAY to the SHUTTLE; One is by pressing the SHUTTLE button and the other is by not pressing the SHUTTLE button. The two method are described here separately. Please refer to page 2-8, for the switching the two ways.

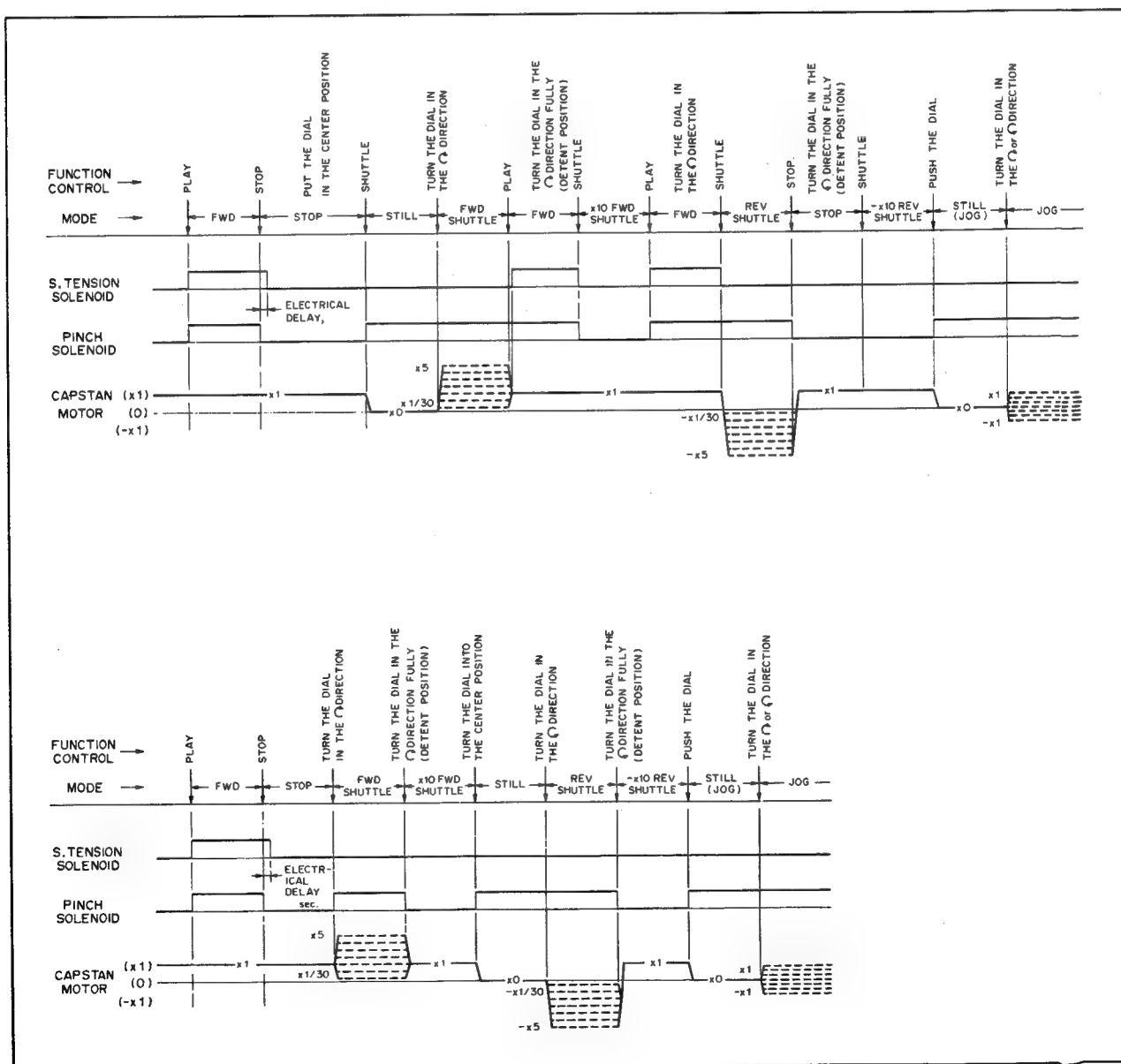
When the DT SELECT switch on the front panel is set in the SEARCH or OFF position, the tape speed in the SHUTTLE operation by using the SEARCH DIAL can be switched to 16 steps to 0,  $\times\pm1/30$ ,  $\times\pm1/10$ ,  $\times\pm1/5$ ,  $\times\pm1/2$ ,  $\times\pm1$ ,  $\times\pm2$ ,  $\times\pm5$ ,  $\times\pm10$ .

In the steps from the  $\times\pm1/30$  to  $\times\pm5$  speed, the pinch roller is engaged and the tape is driven by the capstan.

In the  $\times\pm10$  speed (the SEARCH DIAL is at the detent position), the pinch roller is not engaged and the tape is driven by the supply or the take-up reel.

When the DT SELECT switch is set in the VAR position, the tape speed in the SHUTTLE operation by using the SEARCH DIAL can be switched to 12 steps to  $\times-1$ ,  $\times-1/2$ ,  $\times-1/5$ ,  $\times-1/10$ ,  $\times-1/30$ , 0,  $\times+1/30$ ,  $\times+1/10$ ,  $\times+1/5$ ,  $\times+1/2$ ,  $\times1$ ,  $\times2$ ,  $\times3$ . In all speed, the pinch roller is engaged and the tape is driven by the capstan.

In the JOG operation, the tape speed can be changed from 0 to  $\times\pm1$  and the tape is driven by the capstan.



### 3-4-5. F. FWD and REW Operation

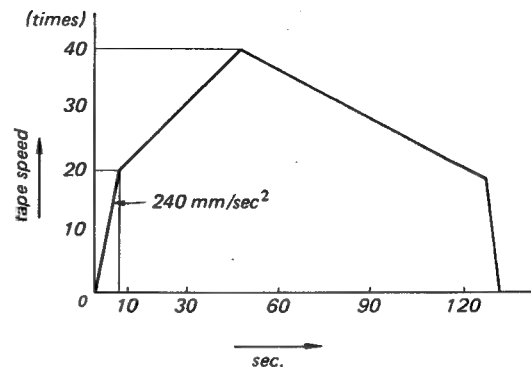
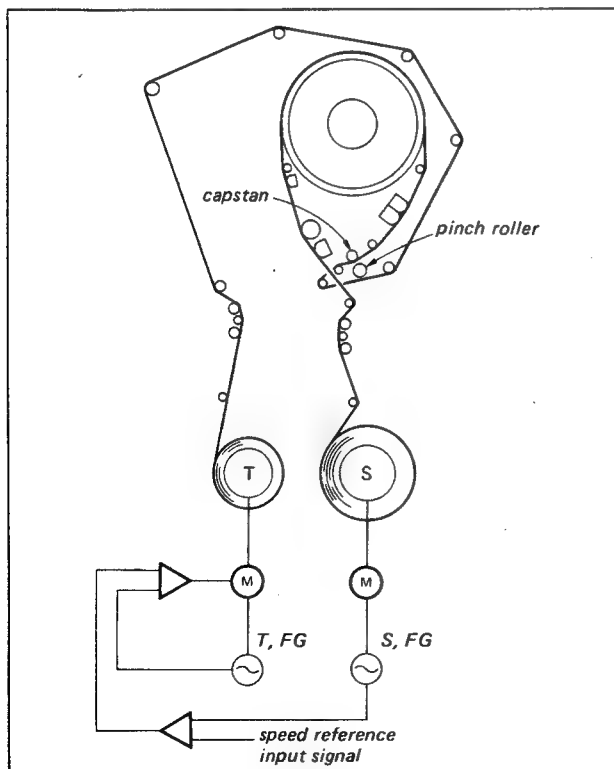
In the F. FWD and the REW operation, the pinch roller is disengaged and the tape is moved by the take-up or the supply reel motor at a high speed.

The reel servo makes the speed servo and the tension servo work on the basis using the detected signals from the tension detectors on the take-up and the supply side and the rotation numbers detected by the DMEs (Divided Type Magnetoresistance Element) near by the take-up and the supply reel table. Then the tape tension and the rotation numbers of the reel table are controlled by the speed servo and the tension servo.

The reel servo system in the F. FWD mode is identical with the one in the REW mode and the servo operation in the F. FWD mode is described here.

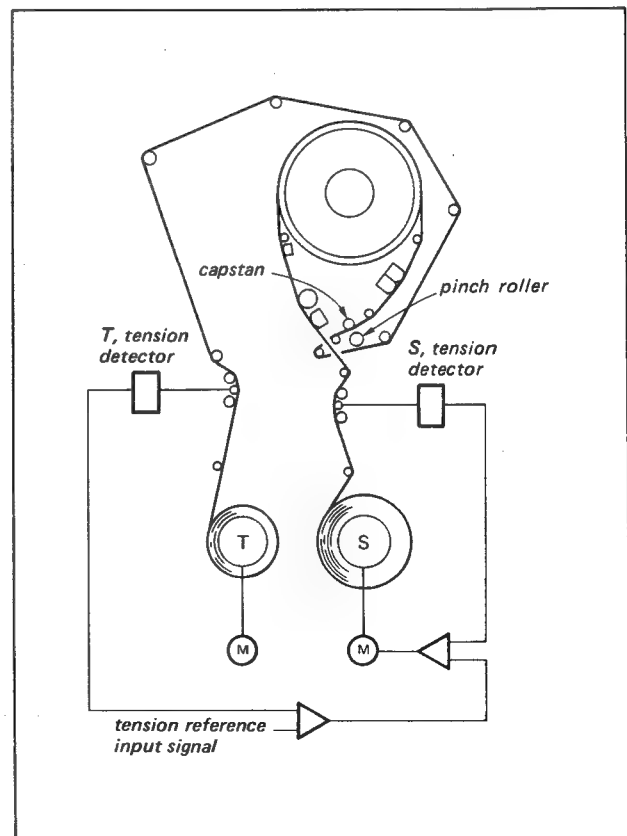
#### (1) Speed Servo System

- The speed servo system is designed as shown in the following block diagram.
- The take-up side FG and the take-up reel motor makes a minor servo loop. In this case the reference input signal is made from the error signal from the revolution speed of the supply reel table and the other reference input signal. Therefore the rotation numbers of the supply reel table from the tape is controlled for constant speed.
- The system regulates the revolution speed of the supply reel of the tape in the F. FWD mode so that the tape overrun becomes minimal (the leader tape does not come into contact with the head drum) when the auto stop mode is set up at the end of the tape and the brake is applied on the reel.
- The speed servo system is designed with above two main loops.



#### (2) Tension Servo System

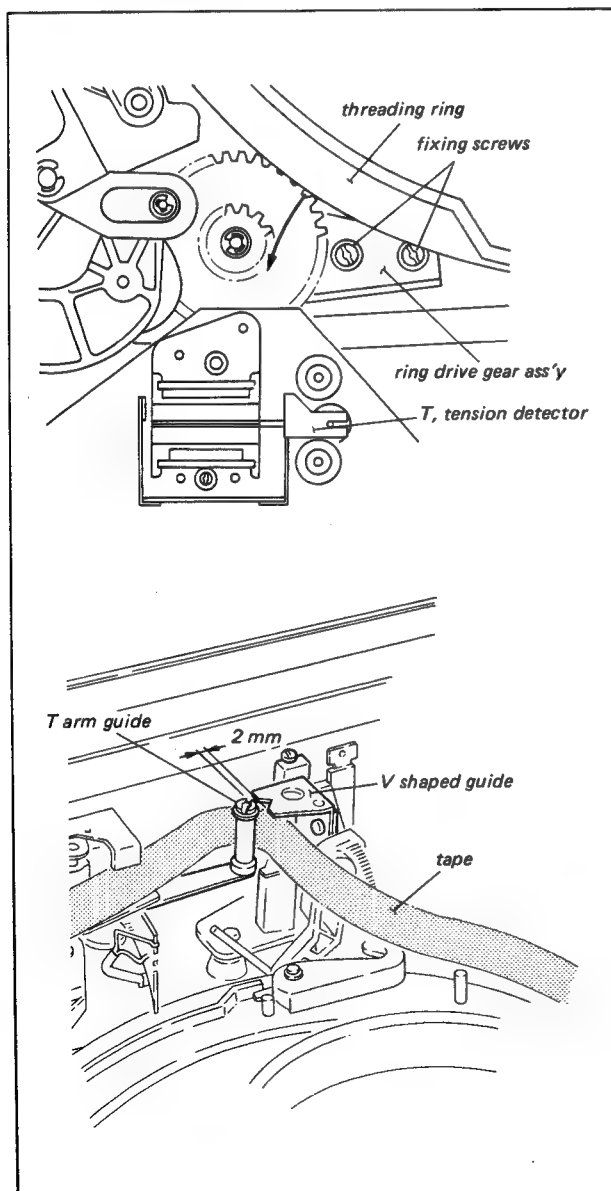
- The tension servo system is designed as shown in the following block diagram.
- The supply side tape tension is detected by the tension detector. And this signal is fed back to the supply reel motor torque.
- The reference input signal of the tape tension is made from the error signal of the tension detector output signal and the other reference input signal of the tape tension.



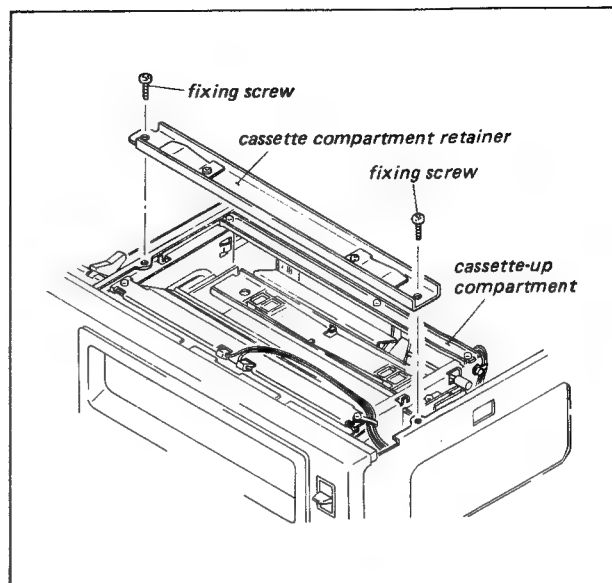
### 3-5. CASSETTE REMOVAL PROCEDURE WHEN NORMAL EJECTION IS NOT POSSIBLE

If the eject operation becomes impossible due to trouble or the cassette-up compartment does not rise when the eject operation takes place, the cassette tape can be removed from the set by the procedures described below.

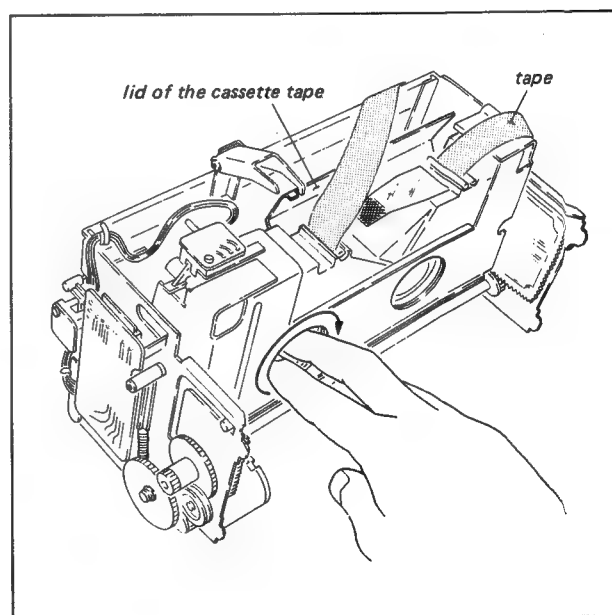
1. Remove the upper panel.
2. Loosen the ring drive gear assembly two mounting screws. And move the ring drive gear assembly in the arrow direction. Turn the threading ring by hand in the counterclockwise direction until the T arm guide moves away about 2 mm from the V shaped guide. (The threading ring and the threading slider move in the unthreading direction. But the tape remains at the position of the threading completion.)



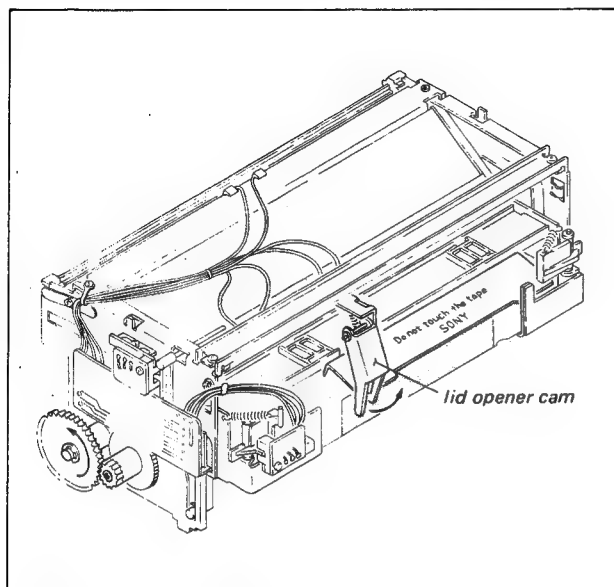
3. Remove the cassette compartment retainer and disconnect the connector on the CC-9 board.



4. Bring up the cassette compartment with the cassette tape in it slowly. Remove the tape remaining in the set carefully so that it does not damage.
5. Hold the cassette tape lid so that it does not close. Wind the tape into the cassette tape by turning the reel hub on the back of the cassette tape with finger.



6. Raise the cam for opening the lid and close the cassette tape lid.



7. Remove the tape from the cassette compartment.
8. Turn the gear on the right side of the cassette compartment counterclockwise direction by hand in order to place the cassette compartment into the up state.
9. Locate the cause of the trouble and remedy the problem.



## SECTION 4

### PERIODIC CHECK AND MAINTENANCE

It is recommended that the following periodic check and maintenance schedule be employed in order to obtain maximum performance and longer tape life from the BVU-820.

#### 4-1. PERIODIC CHECK AND MAINTENANCE SCHEDULE

1. Perform the system control operation check in sec. 4-2 daily before the operation.
2. Perform the maintenance check described separately in accordance with the operating hours of the machine.  
The BVU-820 has an hours meter on the connector panel for the periodic check and the maintenance. The hours meter accumulates and records the elapsed time of all the modes in which the drum rotates while the tape is threaded (i.e., the FWD, REV, REC, SHUTTLE, and JOG modes). It is recommended that the hours meter is used as a tool for determining the periodic check. When the hours meter indicates the maximum value, 1000 hours, the hours meter must be replaced with a new one.  
(SONY Part No.: 1-548-141-41)

3. It is recommended to perform the following checks and adjustments after the machine whose operational hours reach 200, 500, 750, and 1000 hours in order to obtain good quality picture.

If it is not to meet the specifications, perform the upper drum assembly replacement.

**NOTE:** Video head life is effected extensively by operating ambient conditions.

#### 13-1-1. ~ 13-1-2.

Playback Amplifier Adjustment

#### 13-1-3. Y-RF Output Balance/Level Adjustment

#### 13-1-4. Chroma-RF Balance/Level Adjustment (R/P HEAD) Chroma-RF Balance/Level Adjustment (DT HEAD)

#### 13-5-2. Y Record Current Adjustment

#### 13-5-3. Chroma Record Current Adjustment

#### 14-1. Rotary Erase Current Adjustment

○ : Cleaning    ◇ : Check    ◆ : Replacement

Item	Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
	Part No. of replacement part												
Tape path cleaning (including the video heads) (*1)	—	○	○	○	○	○	○	○	○	○	○	○	Perform whenever repair work is attempted
Check and adjustment of the supply side and the take-up side tension detector	—	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	
Replacement of the pinch roller (When the BVU-820 is used as the editing machine)	A-6750-113-D ARM ASS'Y, PINCH	—	◆	—	◆	—	◆	—	◆	—	◆	—	
Replacement of the pinch roller (When the BVU-820 is used as the playback machine (such as on air))	A-6750-113-D ARM ASS'Y, PINCH	—	—	—	◆	—	—	—	◆	—	—	—	
Check the FWD back tension (Replacement of the brake band)	X-3668-045-0 BAND ASS'Y, BRAKE	—	◇	—	◆	—	◇	—	◆	—	◇	—	
Check the brake torque (Replacement of the brake shoe)	X-3642-166-0 SHOE ASS'Y	—	—	—	◇	—	—	—	◆	—	—	—	
Replacement of the belt of the threading motor assembly	3-668-173-00 BELT (3), LM	—	○	—	○	—	○	—	◆	—	○	—	
Replacement of the belt of the cassette compartment	3-653-387-00 BELT, LM	—	—	—	—	—	—	—	◆	—	—	—	
Replacement of the brush of the slip-ring assembly	3-607-104-00 BRUSH or A-6709-360-A BRUSH (4) ASS'Y	—	—	—	—	—	—	—	◆	—	—	—	

NOTE: Regarding overhaul of equipment.

(\*1) refer sec. 4-4-1.

When overhaul of an equipment is attempted, replace parts referring list. For the parts not listed in the following list, such as motors and stationary heads, refer the following items.

reel motor:                    about 3,000 H  
capstan motor:                about        H  
cassette compartment motor: about        H  
threading motor:              about        H  
audio/CTL head:              about 3,000 H  
erase head:                    about 4,000 H  
time code head:                about 4,000 H

#### 4-2-2. Record Function Check

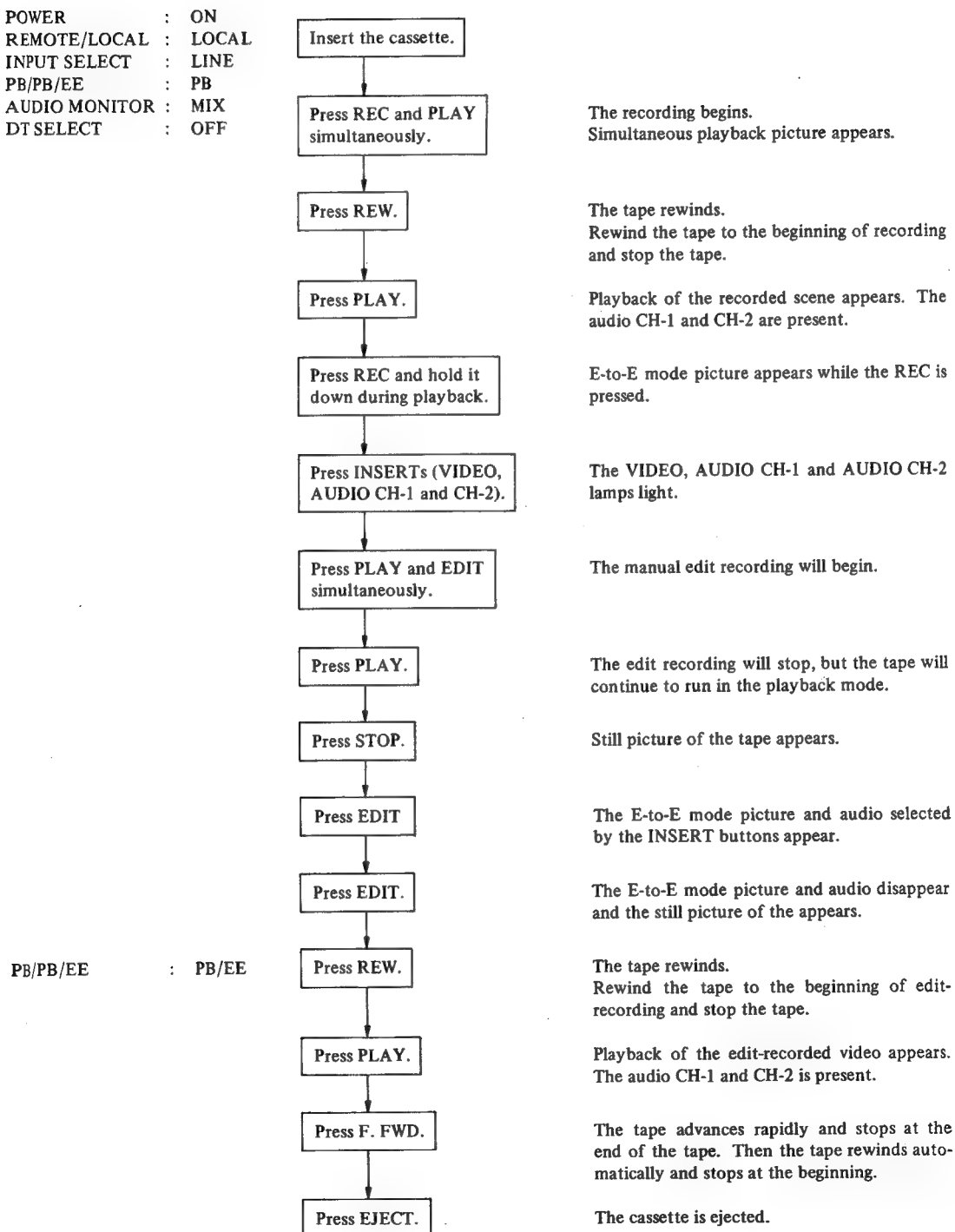
- Insert a video cassette tape on which recording can be made.
- Connect signals to the VIDEO IN, AUDIO IN CH-1 and CH-2 connectors.
- Connect a video and audio monitor.

##### With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 INPUT SELECT : LINE  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

##### Action

##### Check that



### 4-2-3. Editing Function Check

- Install a recorded tape (Video, Audio CH-1/CH-2). (Do not utilize an alignment tape).
- Apply the video and audio CH-1/CH-2 signals.
- The following is the procedure when the SEARCH DIAL switch on the SY-37 board is in the ON position.

With switches set to

POWER : ON  
 REMOTE LOCAL : LOCAL  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

Action

Check that

Insert the cassette.

Press PLAY.

Playback picture appears.

Press Search button.  
 (Search dial at ■ position)

The still picture appears.

Press ENTRY and IN  
 simultaneously.

Note the counter number of the point  
 (edit-in).

Locate a point for the edit-  
 out point with Search dial.

Press ENTRY and OUT  
 simultaneously.

Note the counter number of the point  
 (edit-out).

Press INSERTs (VIDEO,  
 AUDIO CH-1 and AUDIO  
 CH-2).

Press PREVIEW.

Previewing proceeds.

Press IN.

The counter of the edit-in point is  
 displayed.

While pressing IN, press  
 TRIM – ten times.

The counter decreases by ten frames.

Press OUT.

The counter of the edit-out point is  
 displayed.

While pressing OUT, press  
 TRIM + ten times.

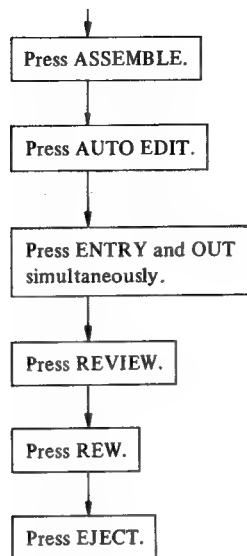
The counter increases by ten frames.

Press AUTO EDIT.

Auto edit recording proceeds.

Press REVIEW.

The reviewing of the edit recorded area pro-  
 ceeds.



The ASSEMBLE button lights.

The point where the AUTO EDIT has been pressed is entered as the edit-in point and auto edit recording begins.

The point is entered as the edit-out point and auto edit recording stops.

The reviewing of the edit recorded area is proceeded.

The tape stops at the beginning.

The cassette is ejected.

#### 4-2-4. Dynamic Tracking Function Check

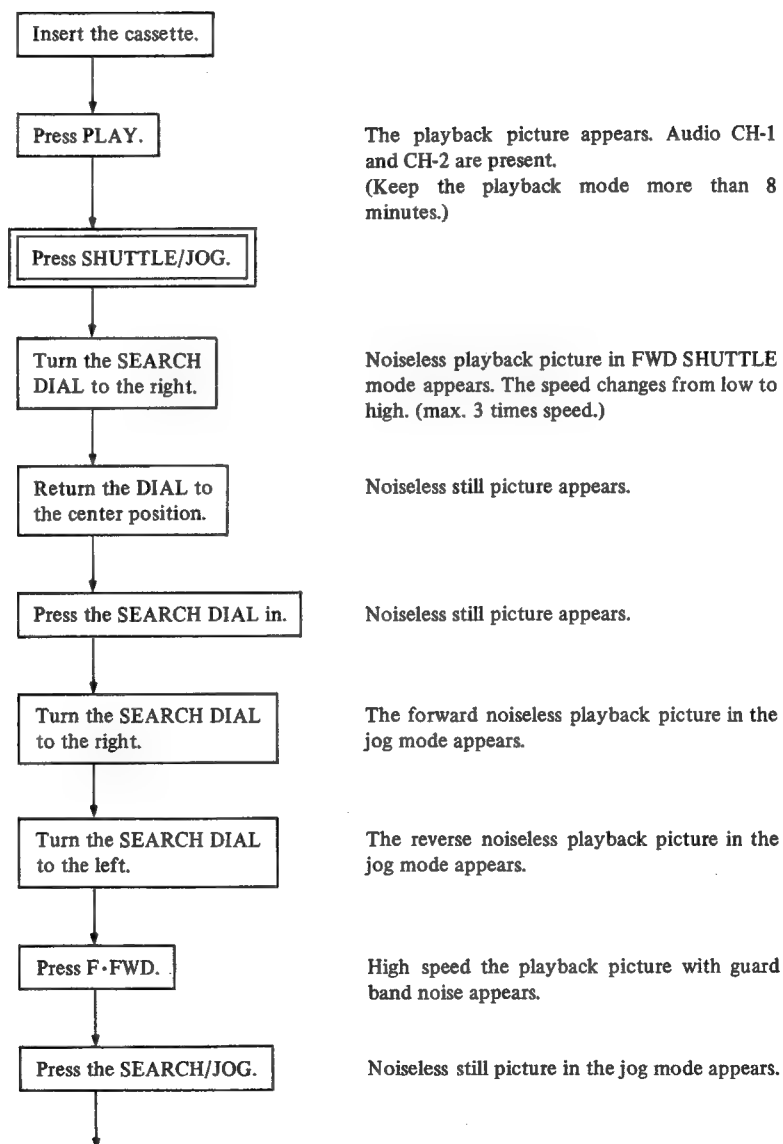
- Thread a recorded tape (Video, Audio CH-1/CH-2). (Do not utilize an alignment tape.)
- Internal switch setting: The following are procedures when the SEARCH DIAL switch on the SY-37 board is in the OFF position. When it is in the OFF position, the procedure indicated within the double lines is not necessary to perform. (Please refer to page 2-8 for further detail on this switch.)

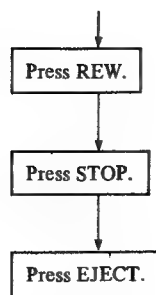
With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : VAR  
 MODE SELECT : TBC

Action

Check that





The tape rewind. The playback picture with guard band noise appears.

The still picture with guard band noise appears.

The cassette is ejected.

#### 4-3. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after repair without regarding the machine operating hours.

1. Video heads and the rotary erase heads cleaning.  
(Referring sec. 4-4-1.)
2. Tape movement area cleaning.  
(Referring sec. 4-4-2.)

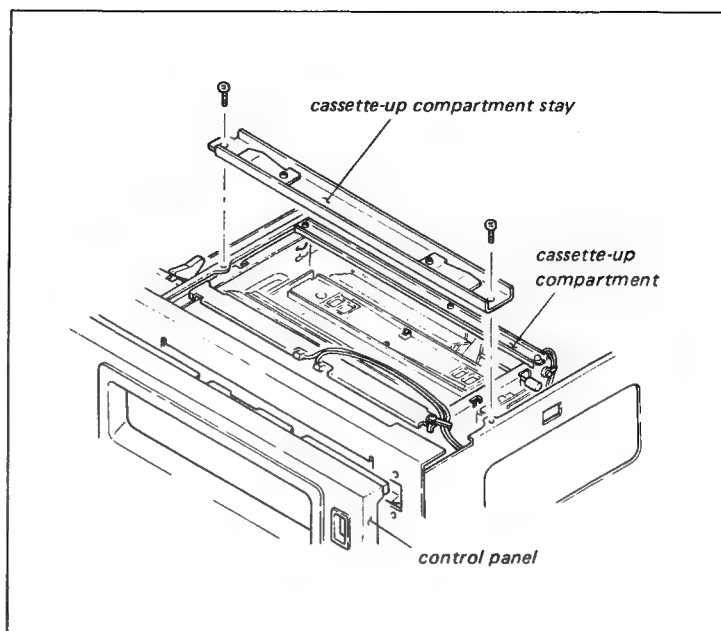
#### 4-4. PERIODIC CHECK AND MAINTENANCE PROCEDURE

When the periodic check or maintenance is attempted, a few items are necessary to remove the cassette-up compartment and to mute the tape beginning sensor and the tape end sensor.

And it is necessary to check the tracking adjustment after the upper drum replacement is attempted.

If necessary, perform the following procedures.

1. Removal of Cassette-up Compartment
  - (1) Remove the upper panel, each side ornamental panels, and the control panel.
  - (2) Remove the cassette-up compartment stay.
  - (3) And bring up the cassette-up compartment from the machine.





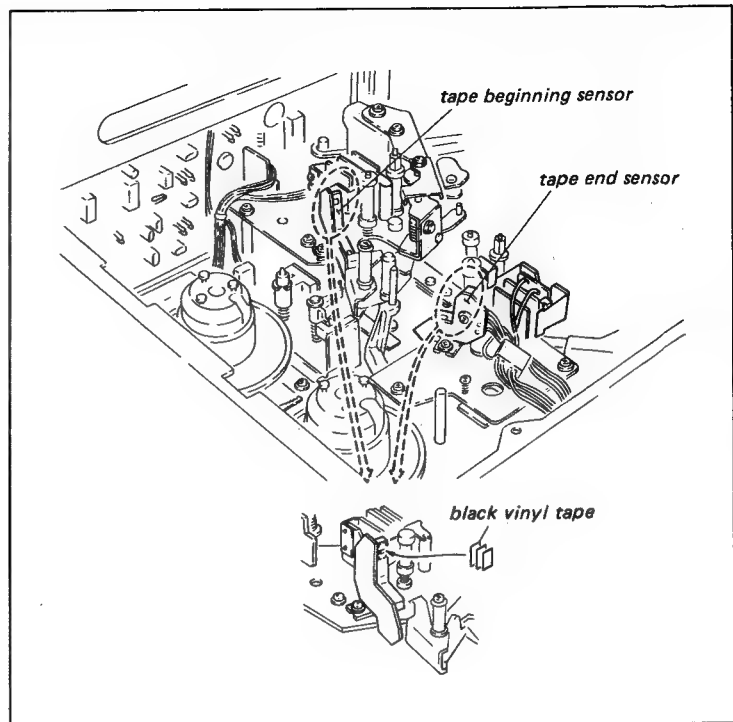
2. Muting of Tape Beginning Sensor and Tape End Sensor

- (1) Cut a piece of black vinyl tape into a piece of 1 cm × 1.5 cm long and place it over to each photo-transistors. Light will path through one or two pieces of tape so that three pieces of black vinyl tape should be over lapped.

**(CAUTION)**

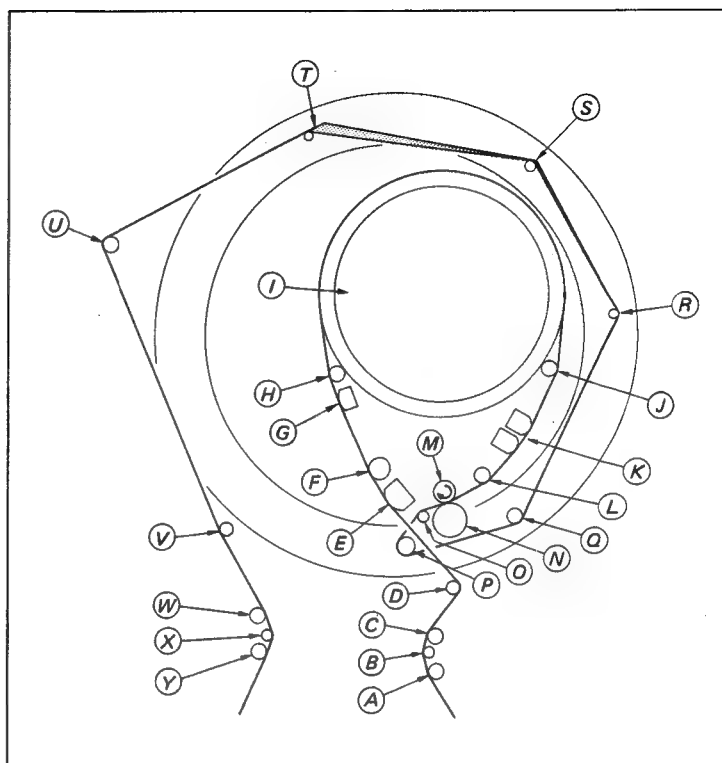
Never forget to remove the black vinyl tape from the two photo-transistors.

If the machine is placed into the F. FWD or REW mode without removing the black vinyl tape, the machine cannot detect the tape beginning or tape end. So the machine cannot operate the AUTO STOP operation. The tape and the machine are put into the dangerous situation.



3. Tracking Check  
Location of the tape guides and heads are follows.

- (A) : supply tape guide 1
- (B) : supply side tension detecting guide
- (C) : supply tape guide 2
- (D) : supply tension regulator arm pin
- (E) : full erase head
- (F) : TG-1
- (G) : time code head
- (H) : TG-2
- (I) : head drum
- (J) : TG-3
- (K) : audio/CTL head
- (L) : TG-4
- (M) : capstan shaft
- (N) : pinch roller
- (O) : correction guide
- (P) : threading guide (1)
- (Q) : threading guide (2)
- (R) : threading guide (3)
- (S) : threading guide (4)
- (T) : correction guide (A)
- (U) : 5th guide
- (V) : 6th guide
- (W) : take-up tape guide 2
- (X) : take-up side tension detecting guide
- (Y) : take-up tape guide 1



The tracking adjustment is required to be performed in the following steps.

- 9-3. Video tracking adjustment
- 9-5-2. Time code head height adjustment
- 9-5-3. Time code head zenith adjustment
- 9-6-1. Audio head height adjustment
- 9-6-2. Audio head zenith adjustment
- 9-6-3. Audio head azimuth adjustment
- 9-6-4. Audio head phase adjustment
- 9-7. Audio/CTL head position adjustment
- 9-8. Video head dihedral adjustment
- 11-11. Switching position adjustment (R/P HEAD)
- 11-17. Switching position adjustment (DT HEAD)
- 11-12. Drum lock phase adjustment
- 13-1-1. ~ 13-1-2. Playback amplifier adjustment
- 13-1-3. Y-RF output balance/level adjustment
- 13-1-4. Chroma-RF balance/level adjustment (R/P HEAD)  
Chroma-RF balance/level adjustment (DT HEAD)
- 13-5-2. Y record current adjustment
- 13-5-3. Chroma rec current adjustment
- 14-1. Rotary erase current adjustment
- 11-16-14. DT self-record/playback adjustment

#### 4-4-1. Cleaning Procedure of the Video Heads and the Rotary Erase Heads

**NOTE:** The Dynamic Tracking Heads are mounted on the upper drum through a bimorph (ceramic). If the bimorph is given a strong force, it is possible that the bimorph will be distorted. It is recommended not to clean the DT heads except only when the DT heads are clogged.

With the power OFF. Press the cleaning piece moistured with the cleaning fluid and turn the drum slowly with hand, cleaning the video heads and the rotary erase heads. (Do not exert too much pressure.)

**NOTE:** Never move the cleaning piece in the vertical direction of the head tip in the cleaning. It may damage the head tips.

#### 4-4-2. Cleaning Procedure of Tape Movement Areas

Wipe the tape bearing surface (of the tape guides, drum, stationary heads, capstan shaft, and the pinch roller) with a piece of cleaning piece moistened with the cleaning fluid.

Cleaning fluid: SONY Part No. Y-2031-001-0

Cleaning piece: SONY Part No. 2-034-697-00

**NOTE:** Don't clean the surface condensation sensor on the lower drum with the cleaning cloth moistened with the cleaning fluid. Clean the surface with dry cloth.

#### 4-4-3. Head Degaussing

It is recommended to demagnetize the rotary heads and the stationary heads with demagnetizer when using as a playback machine.

Demagnetizer: SONY HE-4.

- Bring the tip of the demagnetizer as close as possible to the head tip without actually contacting it. Draw demagnetizer very slowly and turn off demagnetizer when it is at least three feet away from the machine.

#### 4-4-4. Cleaning of Slip-Rings and Brushes

The head drum assembly slip-rings and the brushes do not required periodical cleaning. However if a dust adheres on the slip rings or the brushes, clean the slip-rings or the brushes as follows.

1. Clean the slip-ring or the brush by using soft brush which has short hairs. If this brush can not obtained, use a blower brush and cotton swab.
2. Cleaning fluid is not necessary. However if it is difficult to remove persistent debris, use Freon as cleaning agent.

**NOTE:**

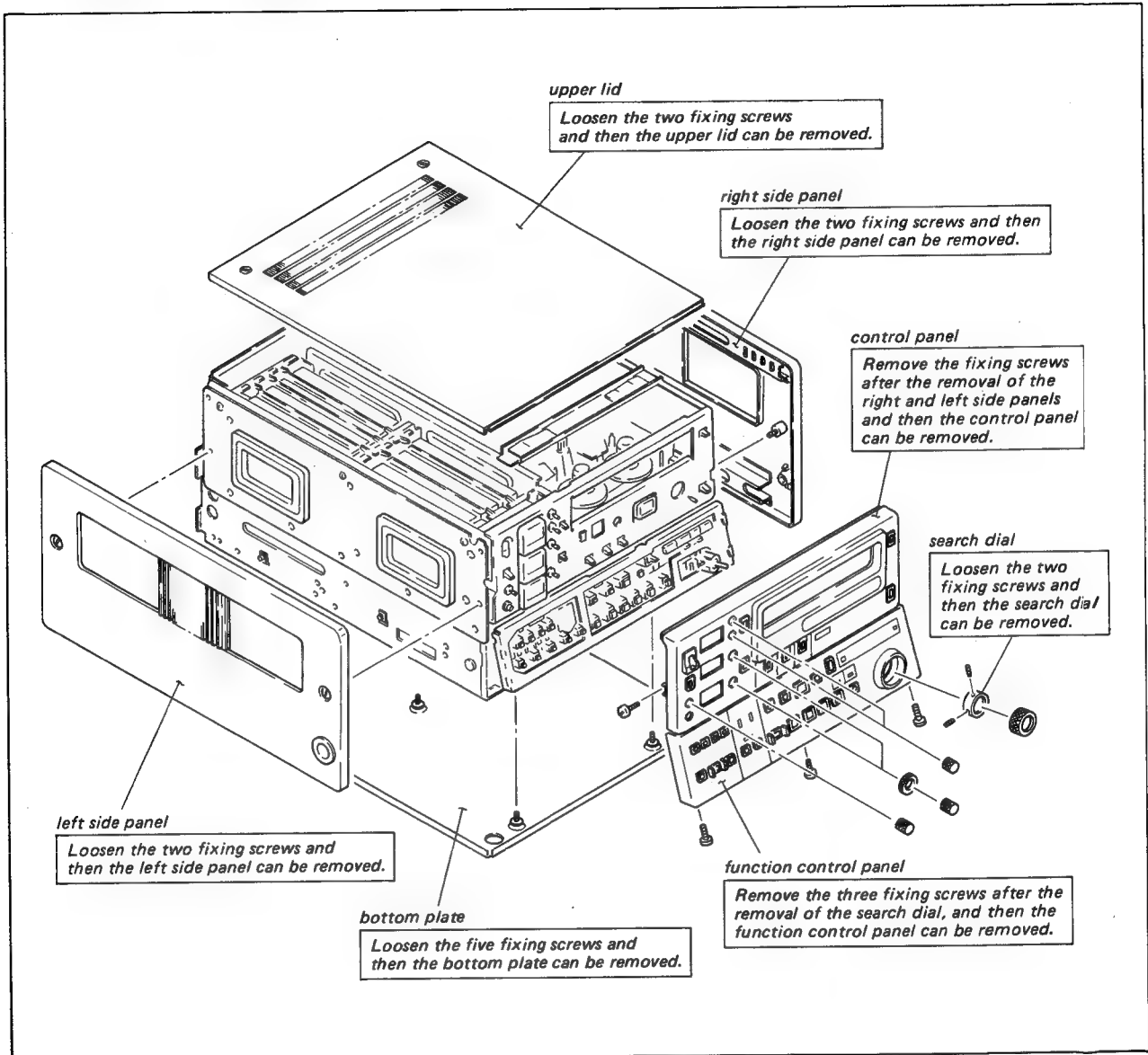
1. Do not use the alcohol as a cleaning fluid. If the slip-rings and the brushes are cleaned with alcohol, the surface tend to attract material which may increase the resistance at the contact area.
2. Do not use conductive grease.



## SECTION 5

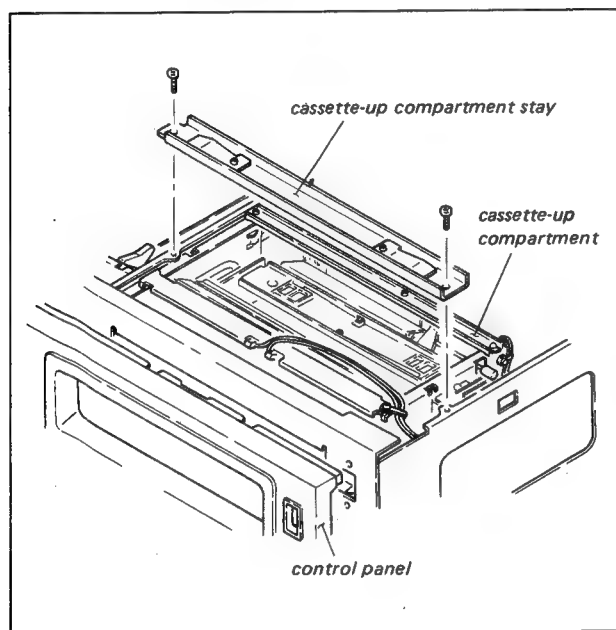
### SERVICE INFORMATION

#### 5-1. REMOVAL OF CABINET



## 5-2. REMOVAL OF CASSETTE-UP COMPARTMENT

1. Remove the upper panel, each side ornamental panels, and the control panel.
2. Remove the cassette-up compartment stay.
3. And bring up the cassette-up compartment from the machine.



## 5-3. SPARE PARTS

1. **Safety Related Components Warning.**  
Components identified by shading marked with **A** on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.
2. **Replacement Parts** supplied from Sony Parts Center will sometimes have a different shape from the original parts. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical spare parts list indicate the parts numbers of "the standardized genuine parts at present".  
Regarding engineering parts changes in our engineering department, refer to Sony service bulletins and service manual supplements.
3. **Printed Components in Bold-Face type** on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

## 5-4. MODULE EXTENDER

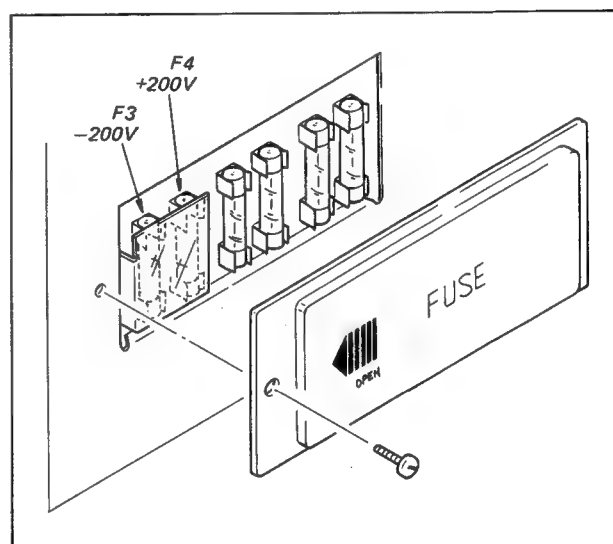
The Amp chassis printed circuit boards can be serviced using a module extender. Simply insert the extender into the Amp chassis and connect the circuit board to be serviced to the end of the extension board.

### (CAUTION)

Be sure to turn off power before inserting or removing extenders or printed circuit boards.

## 5-5. CAUTION OF HIGH VOLTAGE

Do not touch fuse post at any time.



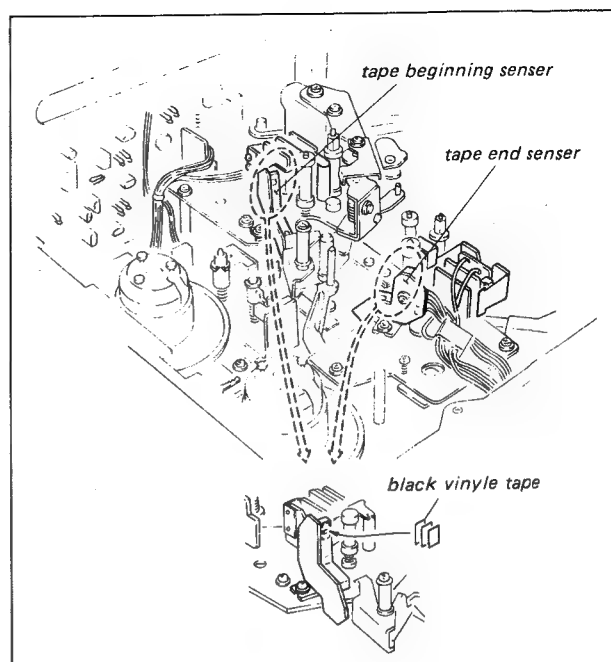
## 5-6. MUTING OF TAPE BEGINNING SENSOR AND TAPE END SENSOR

Cut a piece of black vinyl tape into a piece of 1 cm x 1.5 cm long and place it over to each photo-transistors. Light will path through one or two pieces of tape so that three pieces of black vinyl tape should be over lapped.

### (CAUTION)

Never forget to remove the black vinyl tape from the two photo-transistors.

If the machine is placed into the F. FWD or REW mode without removing the black vinyl tape, the machine cannot detect the tape beginning or tape end. So the machine cannot operate the AUTO STOP operation. The tape and the machine are put into the dangerous situation.



## 5-7. FIXTURE

Parts Number	Description	For Use
J-6001-820-A	Drum Eccentricity Gauge (3)	Upper drum eccentricity adjustment
J-6001-830-A	Drum Eccentricity Gauge (2)	
J-6001-840-A	Drum Eccentricity Gauge (1)	
J-6001-930-A	Drum Eccentricity Gauge (4)	
J-6080-013-A	Dihedral Adjusting Screw	Video head dihedral adjustment
J-6009-830-A	Flatness Plate	Stationary head and tape guide slantness adjustment
J-6130-010-A	Reel Table Height Check Base Jig	Reel table height adjustment
J-6130-020-A	Reel Table Height Check Jig	
J-6150-020-A	Pinch Lever Adjustment Jig	Pinch lever right angle adjustment
J-6150-960-A	Reel Motor Shaft Slantness Check Jig	Reel motor shaft slantness adjustment
Y-2031-001-0 2-034-697-00	Cleaning Fluid Cleaning Piece	Cleaning
3-702-215-01	Torque Measurement Tape (100 mm dia.)	Measurement of torque
3-702-216-01	Back Tension Adjustment Jig	Back tension adjustment
7-723-902-01	Inspection Mirror (handle)	For clearance check
7-723-902-11	Inspection Mirror (mirror)	
7-732-050-30	Tension Scale (100g full scale)	Measurement of back tension and torque
7-732-050-40	Tension Scale (200g full scale)	
7-662-001-62	Sony Grease, SGL-501	For lubrication
8-960-015-16	Alignment Tape RR5-4SB	Tracking, audio, video and overall adjustment
9-911-053-00	Thickness Gauge	For clearance check
Standard Products	Head Demagnetizer (HE-4)	Degaussing of heads

## 5-8. SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set.

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

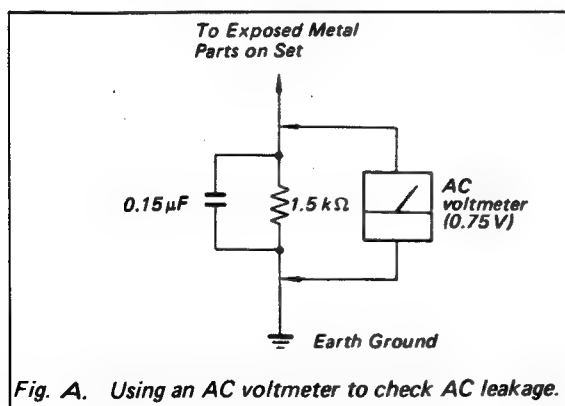


Fig. A. Using an AC voltmeter to check AC leakage.



## SECTION 6

### REPLACEMENT OF MAJOR PARTS

#### 6-1. REPLACEMENT OF DRUM ASSEMBLY

##### Relacement procedure:

- (1) Remove the brush assembly for the slip ring.
- (2) Disconnect the connector of the drum assembly. Remove the three fixing screws and remove the defective drum.
- (3) Install a drum on the base while turning the drum assembly in a counterclockwise direction as seen from top of the set.
- (4) Re-connect the connector.
- (5) Install the brush assembly for the slip-ring.

#### 6-2. REPLACEMENT OF UPPER DRUM ASSEMBLY

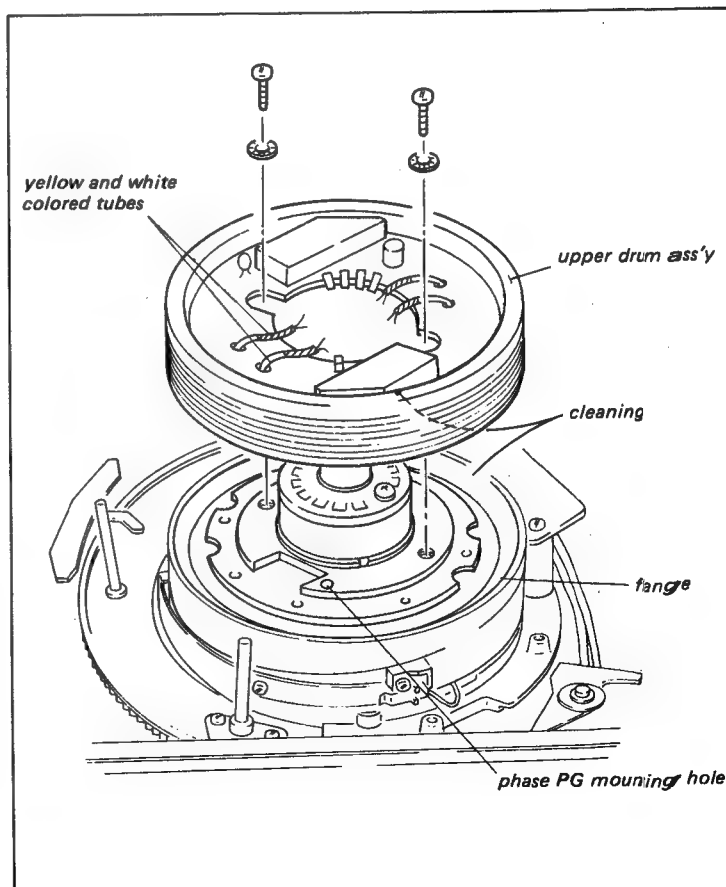
The rotary video and erase heads cannot be replaced individually; the whole upper drum assembly must be replaced when any one of these heads fails.

##### Tool:

- Drum eccentricity gauge (1)
- Drum eccentricity gauge (2)
- Drum eccentricity gauge (3)
- Drum eccentricity gauge (4)

##### Replacement procedure:

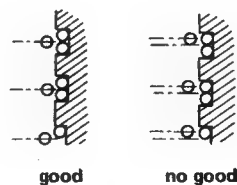
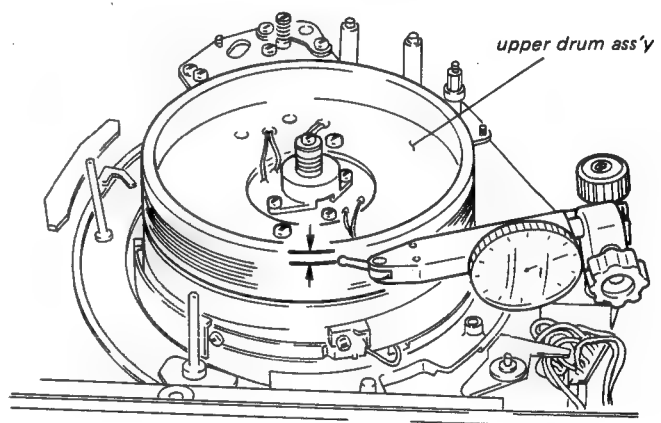
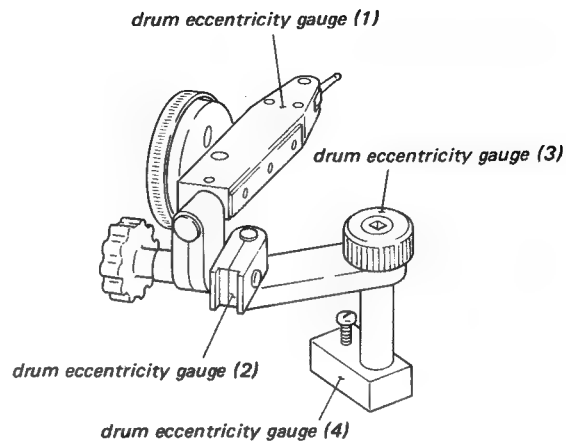
- (1) Remove the brush assembly for slip ring.
- (2) Unsolder the eight leads of the video heads and rotary erase heads and the ten terminals from the rounded type printed circuit board, and remove the upper drum assembly from the head drum assembly.
- (3) Clean the matching surface of the flange and new upper drum assembly with a cloth moistened with cleaning fluid. (If there is a spacer between drum and flange, it should be remain in place, or be re-installed in the same place with the new upper drum assembly.)



- (4) Place the upper drum assembly so that the head of the yellow and white colored tubes are close to the phase PG mounting hold on the surface of the flange.

#### Adjustment procedure:

- (1) Assemble the drum eccentricity gauges (1),(2),(3) and (4) as shown in figure. Mount the assembled jigs on the machine so that the tip probe positions at the point about 5mm apart from the top edge of the upper drum.
- (2) Turn the upper drum slowly clockwise and confirm the pointer deflection of the gauge is within 5 micron during one complete turn of the upper drum. If this specification is satisfied, proceed with step (4). If it is not, perform step (3).
- (3) Tap the inside of the upper drum with a nylon hammer or a screwdriver handle and like so that the gauge deflection remains within 5 micron.
- (4) After the adjustment, tighten the two screws that are securing the upper drum, alternately and gradually using a tightening torque: 14 to 16kg x cm.
- (5) After the screws are tightened, check again that the eccentricity of the upper drum is within 5 micron.
- (6) Solder the eight leads from the video and rotary erase heads and ten terminals on the upper drum assembly to the rounded type printed circuit board.
- (7) Install the brush assembly for the slip ring. (The positional relationship of the slip-ring and the brush must be as shown in the figure.)

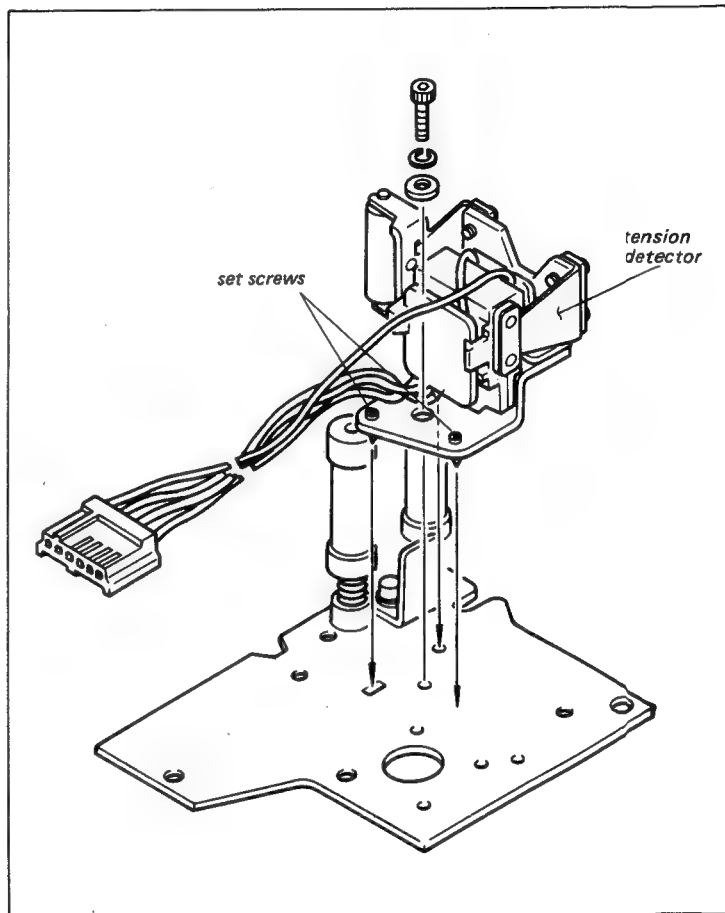


### 6-3. REPLACEMENT OF TENSION DETECTOR

T and S tension detectors are precisely factory calibrated before shipment. Therefore the component parts cannot be replaced as the single parts ;the whole tension detector must be replaced.

#### Replacement procedure:

- (1) Remove the cap screw and remove the tension detector.
- (2) Install the two set screws to the new tension detector.
- (3) Install the tension detector to the set.

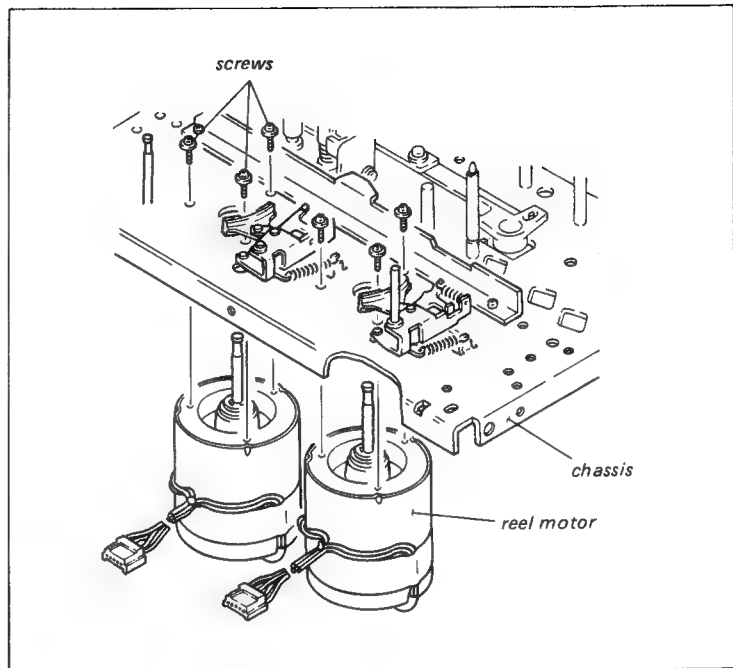


## 6-4. REPLACEMENT OF MOTOR

### 6-4-1. Replacement of Reel Motor

#### Replacement procedure:

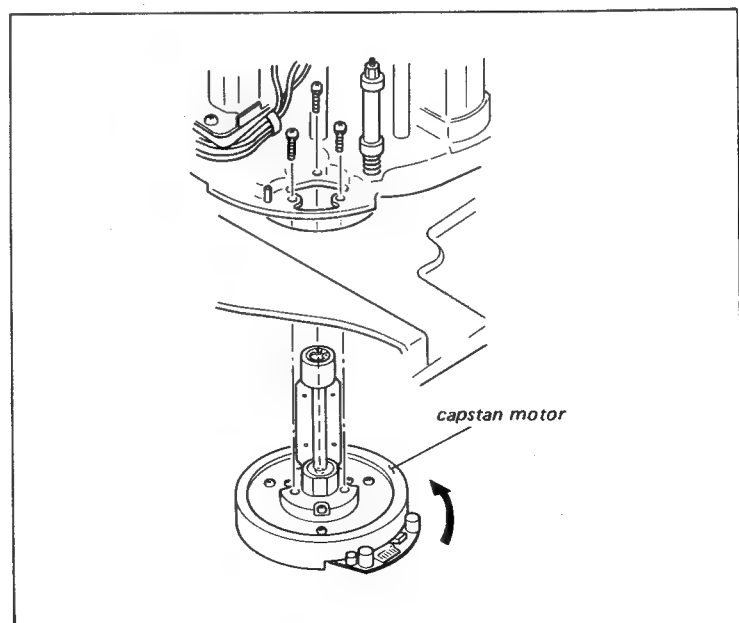
- (1) Loosen the two set screws on the under side of the reel table. Remove the reel table from reel shaft.
- (2) Remove the three screws and replace the reel motor.



### 6-4-2. Replacement of Capstan Motor

#### Replacement procedure:

- (1) Remove the three screws and remove the capstan motor.
- (2) Install the new capstan motor.
- (3) While turning the capstan motor in the counterclockwise direction and tighten the fixing screw.

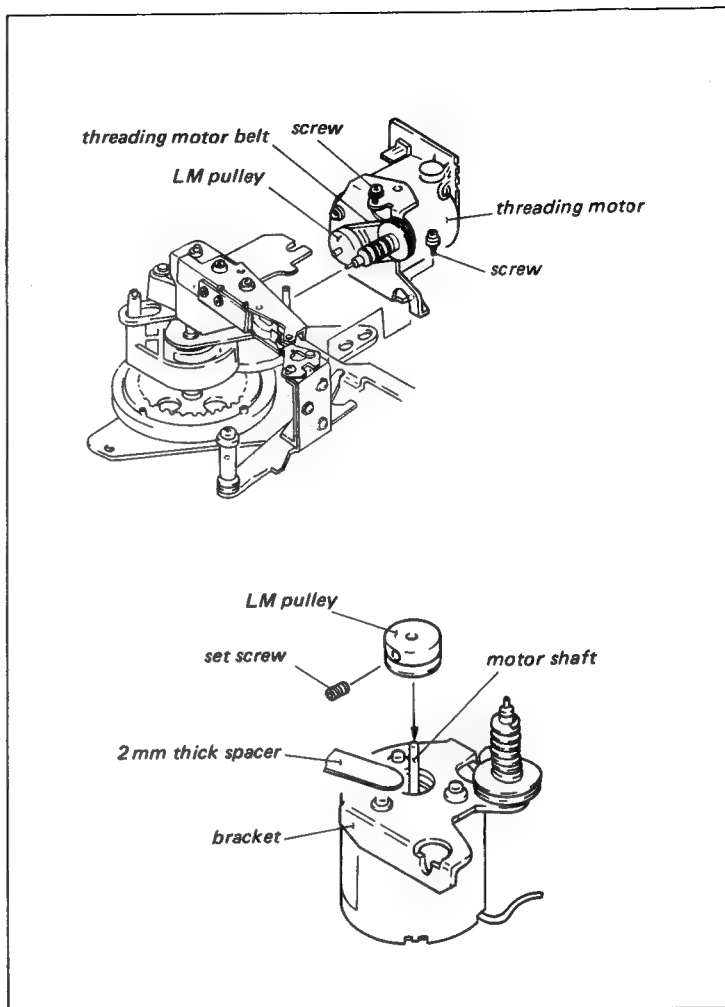


#### 6-4-3. Replacement of Threading Motor

Tool: Allen wrench (each edge has 1.27mm)  
Thickness gauge

##### Replacement procedure:

- (1) Remove the threading motor block from chassis.
- (2) Replace the motor.
- (3) Install the LM pulley so that the clearance between the pulley and the bracket is 2mm.

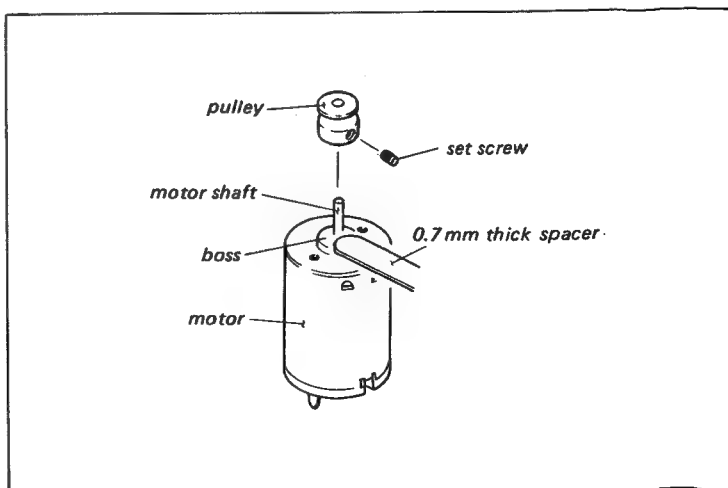


#### 6-4-4. Replacement of Cassette-up Assembly's motor

Tool: Allen wrench (each edge has 1.5mm)  
Thickness gauge

##### Replacement procedure:

- (1) Replace the cassette-up assembly's motor.
- (2) Install the pulley so that it is positioned 0.7mm apart from the edge of the motor boss.

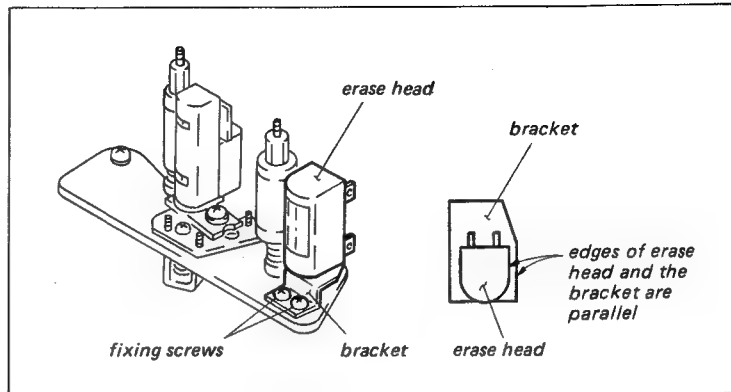


## 6-5. REPLACEMENT OF THE STATIONARY HEAD

### 6-5-1. Replacement of Erase Head

#### Replacement procedure:

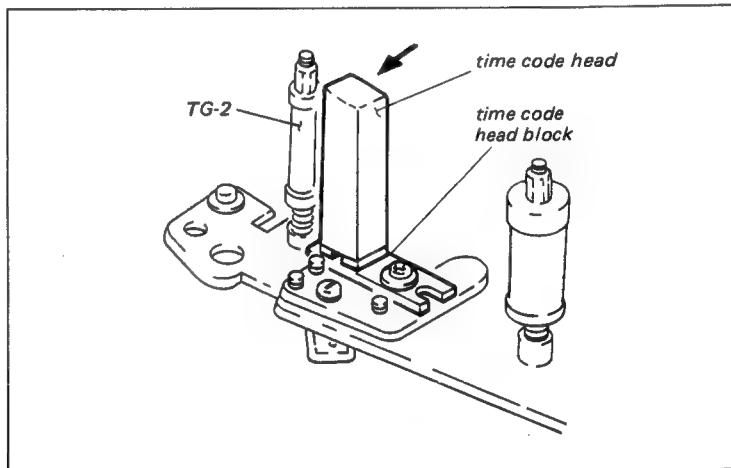
- (1) Remove the erase head block. Remove the two screws and replace the erase head.
- (2) Install the erase head so that the positional relationship between the erase head and bracket is as shown in figure.



### 6-5-2. Replacement of Time Code Head

#### Replacement procedure:

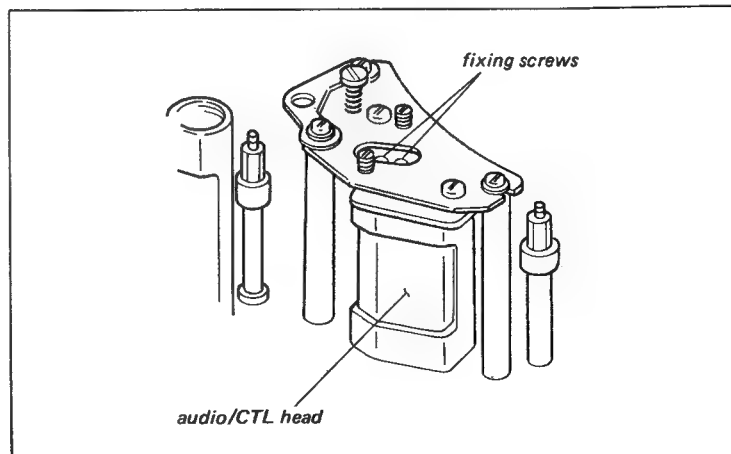
- (1) Remove the time code head block. Remove the two screws and replace the time code head block.
- (2) Install the time code head while pressing it in the direction of the arrow.



### 6-5-3. Replacement of Audio/CTL Head

#### Replacement procedure:

- (1) Remove the audio/CTL head block from the machine.
- (2) Install the audio/CTL head turning in the clockwise direction.

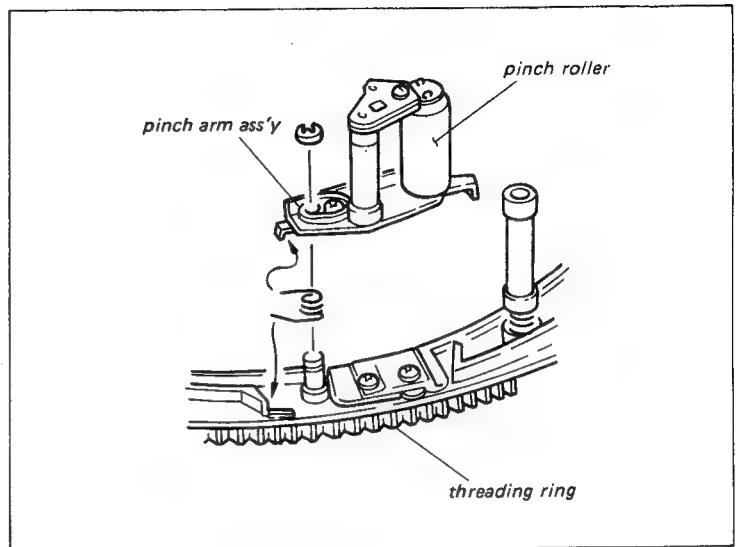


#### 6-6. REPLACEMENT OF PINCH ROLLER

The pinch roller cannot be replaced individually. The whole pinch arm assembly must be replaced.

##### Replacement procedure:

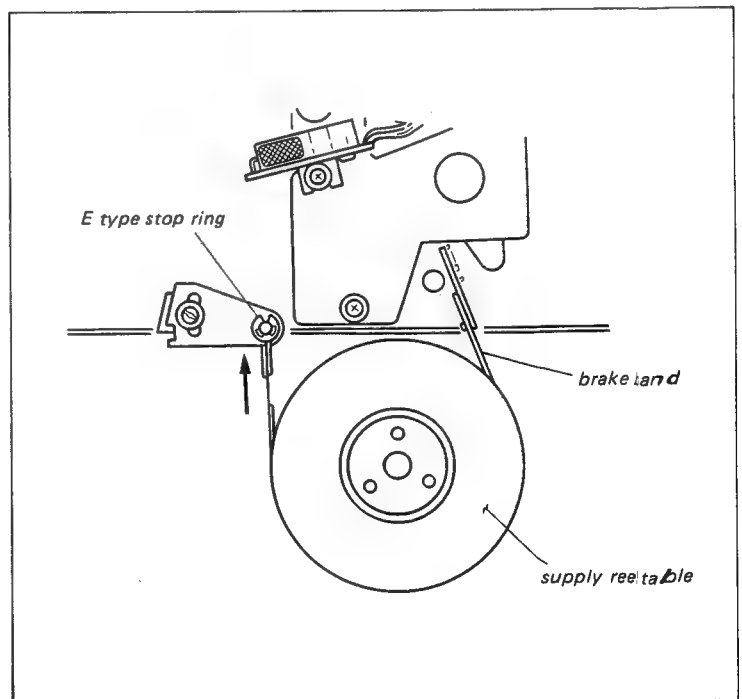
- (1) Remove the pinch arm ass'y from the threading ring.
- (2) Install the new pinch arm ass'y on the threading ring as shown in figure.



#### 6-7. REPLACEMENT OF BRAKE BAND

##### Replacement procedure:

- (1) Put the machine into STOP mode.
- (2) Turn off the power.
- (3) Remove the brake band protector.
- (4) Remove the E type stop ring. And move the brake band in the direction shown by arrow for removal.
- (5) Replace the new one.

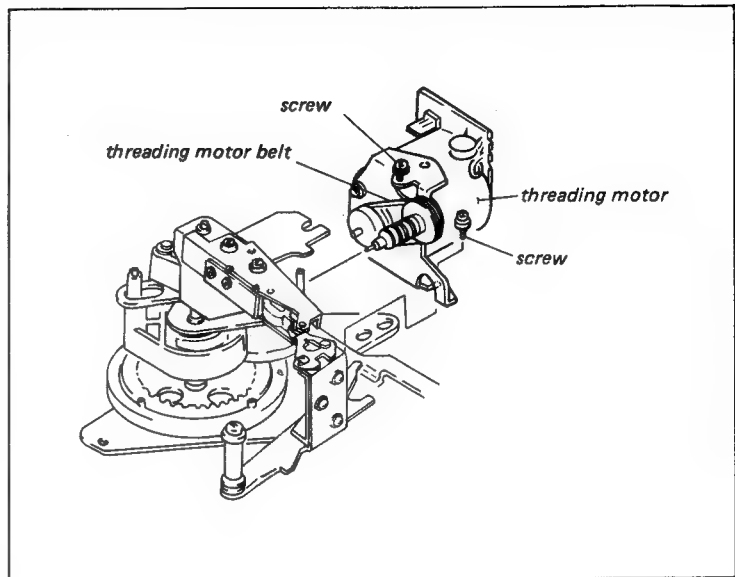


## 6-8. REPLACEMENT OF THE BELT

### 6-8-1. Replacement of the Threading Motor's belt

#### Replacement procedure:

- (1) Put the machine into the EJECT completion mode.
- (2) Turn off the power and remove the MD and YD board.
- (3) Disconnect the connector of the threading motor block.
- (4) Remove the worm gear cover.
- (5) Loosen the two fixing screws of the motor block and remove the motor block toward the amp chassis.
- (6) Replace the belt with a new one.
- (7) Assemble the motor block by reversing steps (6) to (1).
- (8) Turn on the power and insert a cassette tape. Check the threading and unthreading operations are smooth.





## 6-9. BRUSH REPLACEMENT

Spare parts of the brush is prepared as the following two types.

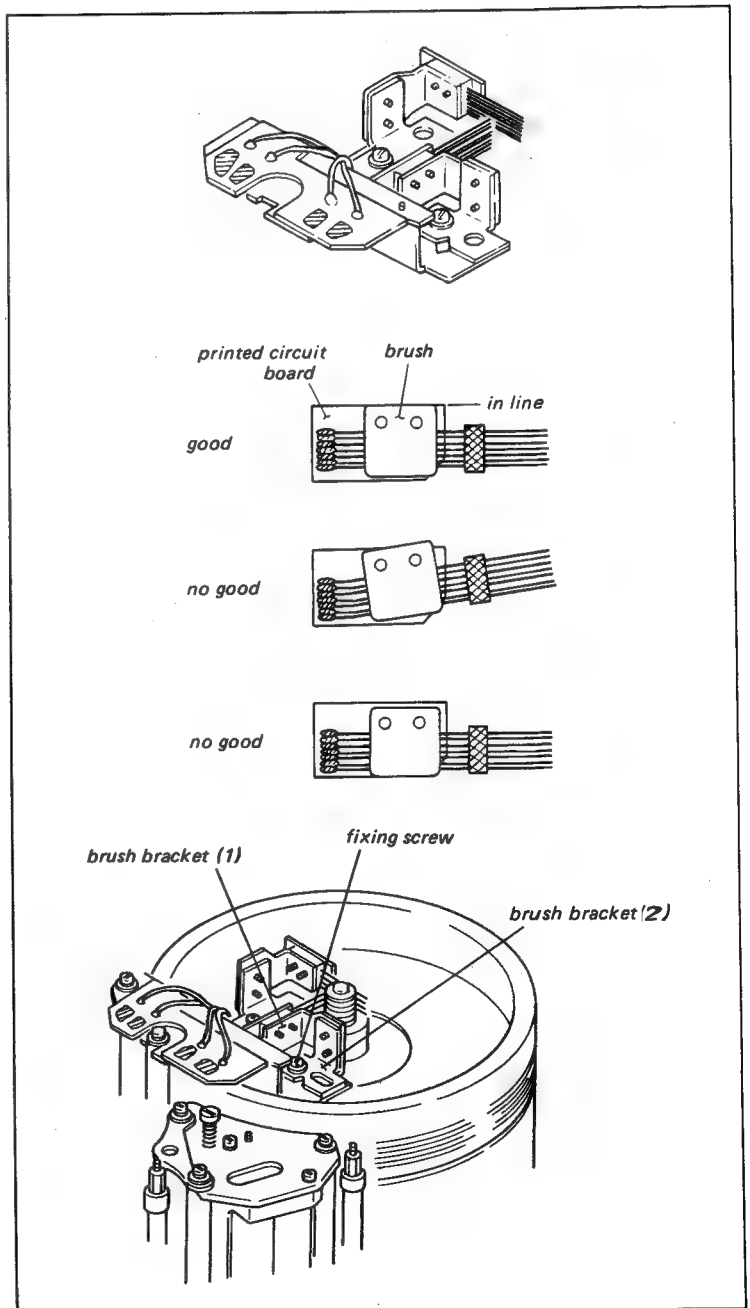
1. Brush assembly as shown in figure.
2. Single part of the brush.

Replacement procedure of the single part is described here.

It is necessary to perform the brush height adjustment and brush position adjustment in any type of spare parts.

### Replacement procedure:

- (1) Remove the brush and solder the new brush to the printed circuit board so that the edge of the brush and the printed circuit board are in the same plane.
- (2) Install the assembled brush into the brush bracket.



## 6-10. ADJUSTMENT ITEM TABLE AFTER MAIN PARTS REPLACEMENT

### Replacement of Drum Assembly

Slip-ring and Brush Position Adjustment (9-9) → FWD Back tension Adjustment (8-4) → Pinch Roller Azimuth Adjustment (9-1-5) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → Video Tracking Adjustment (9-3) → FF/REV Tape Run Overall Adjustment (9-2-6) → Time Code Head Height Adjustment (9-5-2) → Time Code Head Zenith Adjustment (9-5-3) → Audio Head Adjustment (9-6) → Video Head Dihedral Adjustment (9-8) → AUDIO/CTL Head Position Adjustment (9-7) → Drum Free Speed Adjustment (11-2) → Drum Lock Phase Adjustment (11-12) → Switching Position Adjustment (11-11) → Picture Splitting Compensator Adjustment (11-13) → Dynamic Tracking Control System Adjustment (11-16) → RF Frequency Response Adjustment (13-1-1, 13-1-2) → Y-RF Balance/Level Adjustment (13-1-3) → Chroma-RF Balance/Level Adjustment (13-1-4) → Record Current Frequency Response Adjustment (13-5-1) → Y Record Current Adjustment (13-5-2) → Chroma Record Current Adjustment (13-5-3) → Overall Frequency Response Adjustment (13-7) → Rotary Erase Current Adjustment (14-1)

### Replacement of Upper Drum Assembly

Upper Drum Eccentricity Adjustment (6-2) → Slip-ring and Brush Position Adjustment (9-9) → Video Tracking Adjustment (9-3) → FF/REV Tape Run Overall Adjustment (9-2-6) → Time Code Head Height Adjustment (9-5-2) → Time Code Head Zenith Adjustment (9-5-3) → Audio Head Adjustment (9-6) → Video Head Dihedral Adjustment (9-8) → AUDIO/CTL Head Position Adjustment (9-7) → Drum Free Speed Adjustment (11-2) → Drum Lock Phase Adjustment (11-12) → Switching Position Adjustment (11-11) → Picture Splitting Compensator Adjustment (11-13) → Self Record/Playback Adjustment (11-16-14) → RF Frequency Response Adjustment (13-1-1, 13-1-2) → Y-RF Balance/Level Adjustment (13-1-3) → Chroma-RF Balance/Level Adjustment (13-1-4) → Record Current Frequency Response Adjustment (13-5-1) → Y Record Current Adjustment (13-5-2) → Chroma Record Current Adjustment (13-5-3) → Overall Frequency Response Adjustment (13-7) → Rotary Erase Current Adjustment (14-1)

### Replacement of AUDIO/CTL Head

Audio Head Zenith Adjustment (9-6-2) → Audio Head Azimuth Adjustment (9-6-3) → Audio Head Height Adjustment (9-6-1) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Audio Head Height Adjustment (9-6-1) → Audio Head Azimuth Adjustment (9-6-3) → Audio Head Phase Adjustment (9-6-4) → AUDIO/CTL Head Position Adjustment (9-7) → Playback Frequency Response/Level Adjustment (12-6) → Playback Output Level Adjustment (12-7) → Record Level Adjustment (12-17) → Record Current Frequency Response Adjustment (1) (12-18) → Record Current Frequency Response Adjustment (2) (12-19) → Audio Erase Current Adjustment (1) (12-9) → Audio Erase Current Adjustment (2) (12-10) → Audio Erase Current Adjustment (3) (12-11) → Record Bias Current Adjustment (1) (12-12) → Record Bias Current Adjustment (2) (12-16)

#### Replacement of Time Code Head

Time Code Head Zenith Adjustment (9-5-3) → Time Code Head Tape-to-Head Contact Adjustment (9-5-1) → Time Code Head Height Adjustment (9-5-2) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (9-7) → Time Code Playback/Output Level Adjustment (14-4) → Time Code Record Current Adjustment (14-5)

#### Replacement of Erase Head

Erase Head Zenith Adjustment (9-4) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Capstan Motor

Capstan Free Speed Adjustment (11-3) → Pinch Roller Adjustment (9-1) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Video Tracking Adjustment (9-3) → AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Pinch Roller

Pinch Roller Self-Alignment Adjustment (9-1-3) → Pinch Roller Zenith Adjustment (9-1-4) → Pinch Roller Azimuth Adjustment (9-1-5) → Pinch Roller Preset Adjustment (9-1-6) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → Video Tracking Adjustment (check) (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (check) (9-7)

#### Replacement of Threading Ring

Threading Ring Rotation Adjustment (7-10-1) → Ring Drive Gear Engagement Adjustment (7-10-2) → Ring Sensor Position Adjustment (7-10-3) → Threading Slider Assembly End Position Adjustment (7-10-5) → Threading Slider EJECT Position Adjustment (7-10-6) → Release Cam Installing Position Adjustment (7-10-7) → Pinch Roller Stopper Position Adjustment (9-1-2) → Pinch Roller Self-Alignment Adjustment (9-1-3) → Pinch Roller Zenith Adjustment (9-1-4) → Pinch Roller Azimuth Adjustment (9-1-5) → Pinch Roller Preset Adjustment (9-1-6) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → Tape Run Adjustment at Correction Guide (A) (9-2-3) → Tape Run Adjustment at 6th Guide (9-2-4) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Take-up Reel Table

Reel Table Height Adjustment (7-2) → EM-1 Board Mounting Position Adjustment (7-3) → Brake Torque Adjustment (8-3) → FWD/REV Tape Run Overall Adjustment (9-2-6)

#### Replacement of Supply Reel Table

Reel Table Height Adjustment (7-2) —→ EM-1 Board Mounting Position Adjustment (7-3) —→ Brake Torque Adjustment (8-3) —→ Supply tension Regulator Arm FWD Position Adjustment (7-6) —→ FWD Back Tension Adjustment (8-4) —→ Video Tracking Adjustment (9-3) —→ FWD/REV Tape Run Overall Adjustment (9-2-6)

#### Replacement of Brake Band

Supply Tension Regulator Arm FWD Position Adjustment (7-6) —→ FWD Back Tension Adjustment (8-4) —→ FWD/REV Tape Run Overall Adjustment (9-2-6) —→ Video Tracking Adjustment (check) (9-3) —→ AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Take-up Reel Motor

Reel Motor Shaft Slantness Adjustment (7-4) —→ Reel Table Height Adjustment (7-2) —→ EM-1 Board Mounting Position Adjustment (7-3) —→ Take-up Reel Motor Speed Adjustment (11-14) —→ Take-up Reel Motor Current Sensitive Adjustment (8-7) —→ Brake Torque Adjustment (8-3) —→ FWD/REV Tape Run Overall Adjustment (9-2-6) —→ Video Tracking Adjustment (check) (9-3)

#### Replacement of Supply Reel Motor

Reel Motor Shaft Slantness Adjustment (7-4) —→ Reel Table Height Adjustment (7-2) —→ EM-1 Board Mounting Position Adjustment (7-3) —→ Supply Reel Motor Speed Adjustment (11-15) —→ Supply Reel Motor Current Sensitive Adjustment (8-8) —→ Brake Torque Adjustment (8-3) —→ Supply Tension Regulator Arm FWD Position Adjustment (7-6) —→ FWD Back Tension Adjustment (8-4) —→ FWD/REV Tape Run Overall Adjustment (9-2-6) —→ Video Tracking Adjustment (check) (9-3) —→ AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Tension Detector

Tension Detector Adjustment (8-5)

## SECTION 7

### LINK AND DRIVE SYSTEM ALIGNMENT

#### (PREPARATION)

When the adjustment in this section is attempt, there are few items to need operating as follows.

#### (1) Removal of Cassette-up Compartment

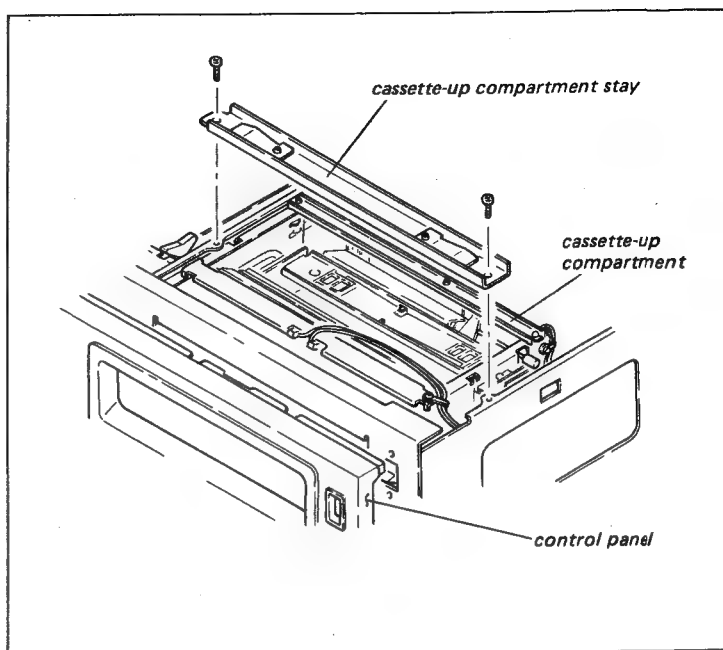
Remove the upper panel, each side ornamental panels.

Loosen the right and left sides fixing screws of control panel.

Remove the cassette-up compartment stay.

Disconnect the connector of the cassette-up compartment.

And bring up the cassette-up compartment from the machine.



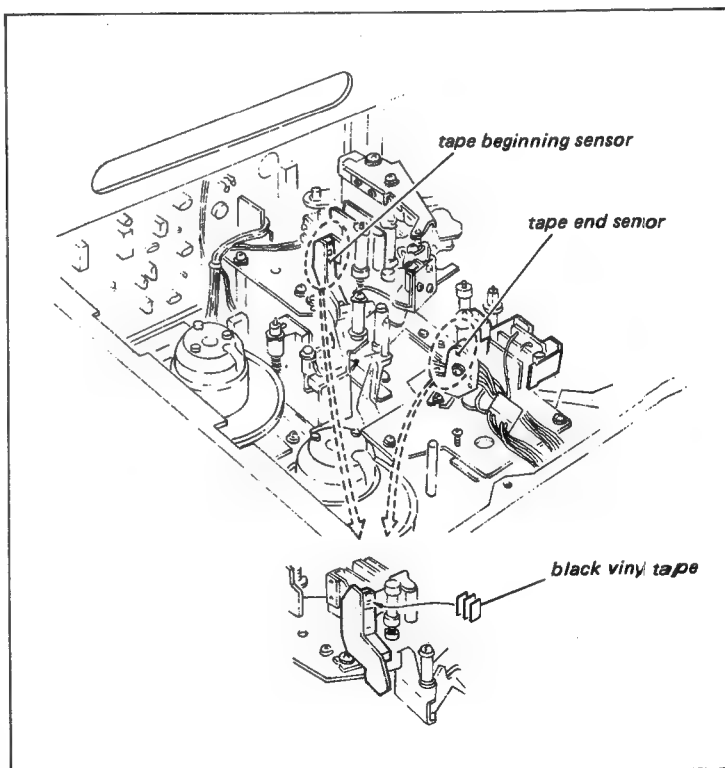
#### (2) Muting of Tape Beginning Sensor and Tape End Sensor

There are two sensors to detect the tape beginning and the tape end and to operate the AUTO STOP near the supply and take-up reel tables. When the machine is operated without inserting the cassette-tape, it is necessary to mute this function.

Cut a piece of black vinyl tape into a piece of 1 cm x 1.5 cm long and place it over to each photo-transistors. Light will path through one or two pieces of tape so that three pieces of black vinyl tape should be over-lapped.

#### (CAUTION)

Never forget to remove the black vinyl tape from the two photo-transistors. If the machine is placed into the F.FWD or REW mode without removing the black vinyl tape, the machine cannot detect the tape beginning or tape end. So the machine cannot operate the AUTO STOP operation. The tape and the machine are put into the dangerous situation.



**(3) Module Extender**

Be sure to turn off power before inserting or removing printed circuit board. Do not touch the connector of printed circuit board.

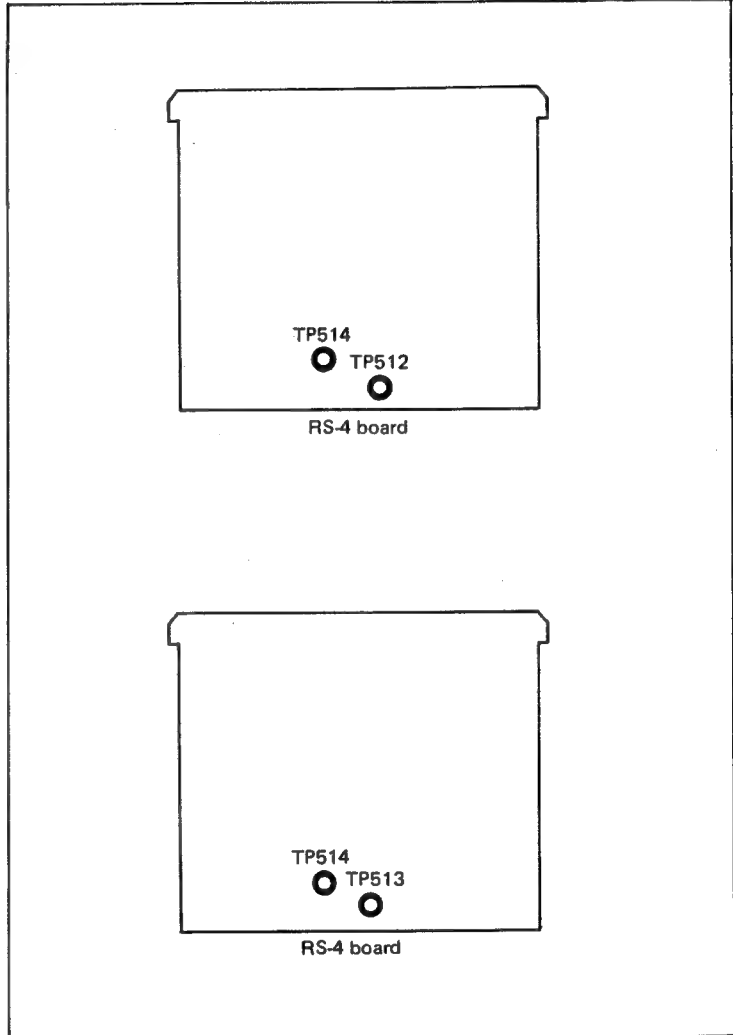
**(4) Muting of TAPE PROTECTION Signal**

When the machine is put into the PLAY, FF or REW mode without inserting the cassette tape, it is necessary to mute the TAPE PROTECTION signal for the tape protection. These operations are as follows.

.Remove the RS-4 board.

.Insert the extension board into this position and insert the RS-4 board to the end of the extension board.

Short between TP512 and TP514/RS-4 with short clip lead.

**(5) Muting of THREADING MOTOR DISABLE Signal**

It is necessary to stop the THREADING MOTOR DISABLE signal so that the machine is putted into the threading or unthreading mode without inserting the cassette tape.

These operations are as follows.

Remove the RS-4 board from the machine

Insert the extension board into this position and insert the RS-4 board to the end of the extension board.

Short between TP513 and TP514/RS-4 with short clip lead.

**(6) Cassette Insertion in Alignment**

The tape does not insert except the particular appointment in this alignment.

**(7) Definition of Mode and Procedure to Put the Machine into the Certain Mode without Cassette Tape.**

•EJECT Completion Mode.

The states that the 5th guide, 6th guide and the supply tension regulator arm return to the EJECT position completely. The machine is put into the mode as mentioned above to press the EJECT button.

•STOP Mode

The states that the threading ring turns into the clockwise direction as far as it will go and the pinch roller is positioned in front of the capstan shaft.

Turn on the power after mute the functions of tape beginning and end sensors.

One or two seconds later, start the threading operation automatically and put the machine into the STOP mode.

•PLAY Mode

Stop the functions of the TAPE PROTECTION signal and THREADING DISABLE signal.

Put the machine into STOP mode as mentioned above and press the PLAY button.

Grasp the supply and take-up reel tables by hand. The machine is putted into the PLAY mode automatically.

### 7-1. CASSETTE RETAINER HEIGHT ADJUSTMENT

**Tool:**

Reel table height check base jig  
Thickness gauge

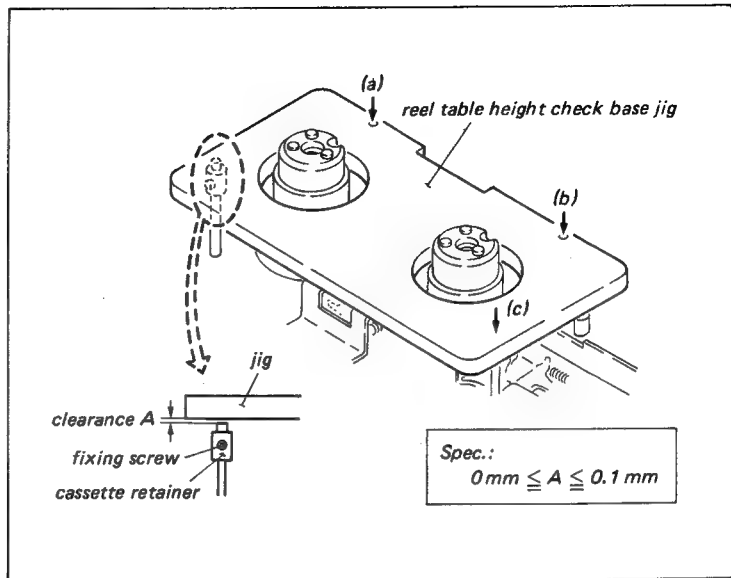
**Mode:** STOP

**Check procedure:**

Check that the clearance between the base jig and the cassette retainer meets the required specification while pushing lightly the reel table height check base jig marked (a), (b) and (c) toward the chassis.

**Adjustment procedure:**

Adjust the position of the cassette retainer to meet the required specification.



### 7-2. REEL TABLE HEIGHT ADJUSTMENT

Since the reel table height from the chassis functions as the reference height in the entire tape thread and run system, it is required that the reel table height adjustment should be attempted carefully, and deliberately.

**Tool:**

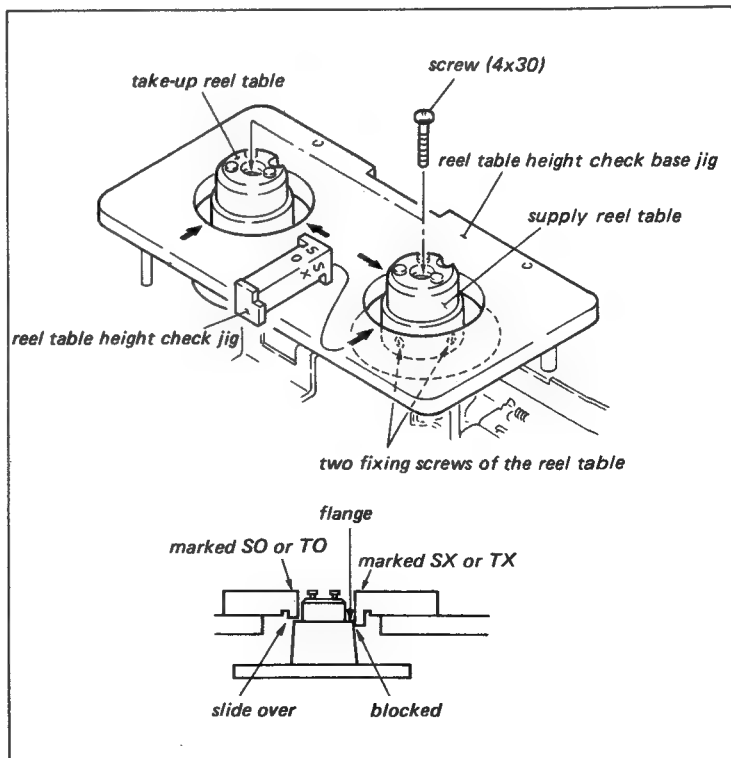
Reel table height check base jig  
Reel table height check jig  
Screw (4 x 30)  
Allen wrench (each edge has 1.5mm)

**Mode:** Power off mode

**Check procedure:**

Check that the probes of the reel table height check jig marked "SO" and "TO" can slide over the reel table leaving a space between the jig and the reel table, while the probes marked "SX" and "TX" are blocked, and cannot slide over reel table.

Use the "SO" and "SX" probes for the supply reel table.  
Use the "TO" and "TX" probes for the take-up reel table.





**Adjustment procedure:**

- (1) Thread the screw (4 x 30) at the center of the reel table as far as it will go.
- (2) Loosen the two fixing screws of the reel table.
- (3) Turn the threaded screw to meet the required specification.  
When heigher the reel table, press it lightly while turning the screw to the counterclockwise direction.
- (4) After adjusting, tighten the screws at the side of reel table and check height again.

**7-3. EM-1 BOARD MOUNTING POSITION ADJUSTMENT**

**Tool:** Thickness gauge

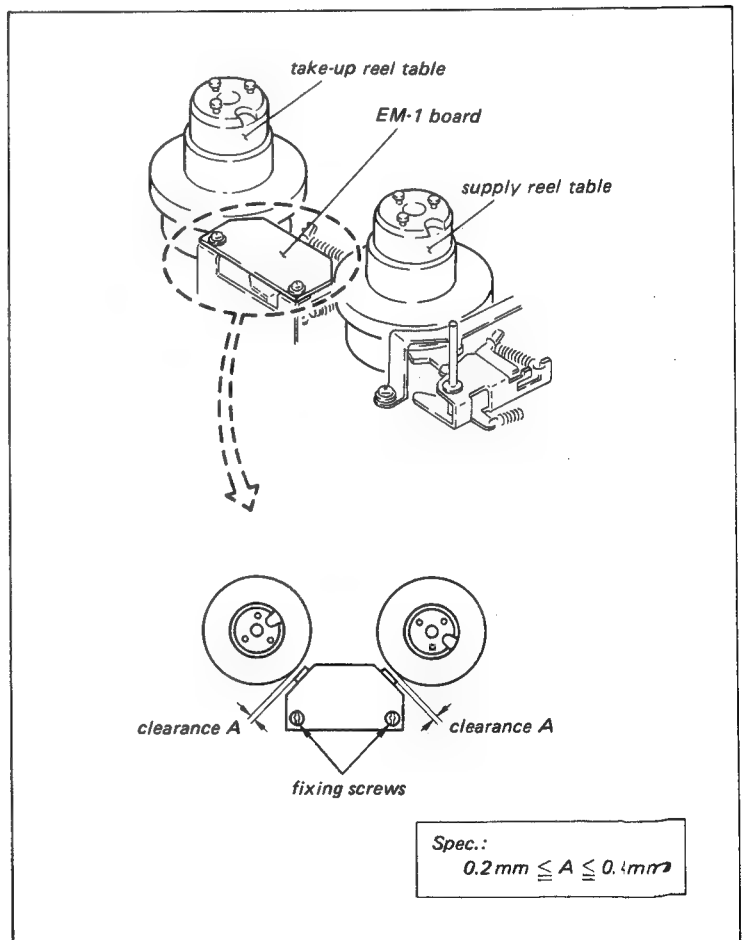
**Mode:** STOP

**Check procedure:**

Check that the clearance meets the required specification.

**Adjustment procedure:**

Adjust the EM-1 board mounting position.



#### 7-4. REEL MOTOR SHAFT SLANTNESS ADJUSTMENT

This adjustment is required only when the reel motor is replaced or removed.

##### Tool:

Reel table height check base jig  
Reel motor shaft slantness check jig

Mode:EJECT completion

##### Preparation:

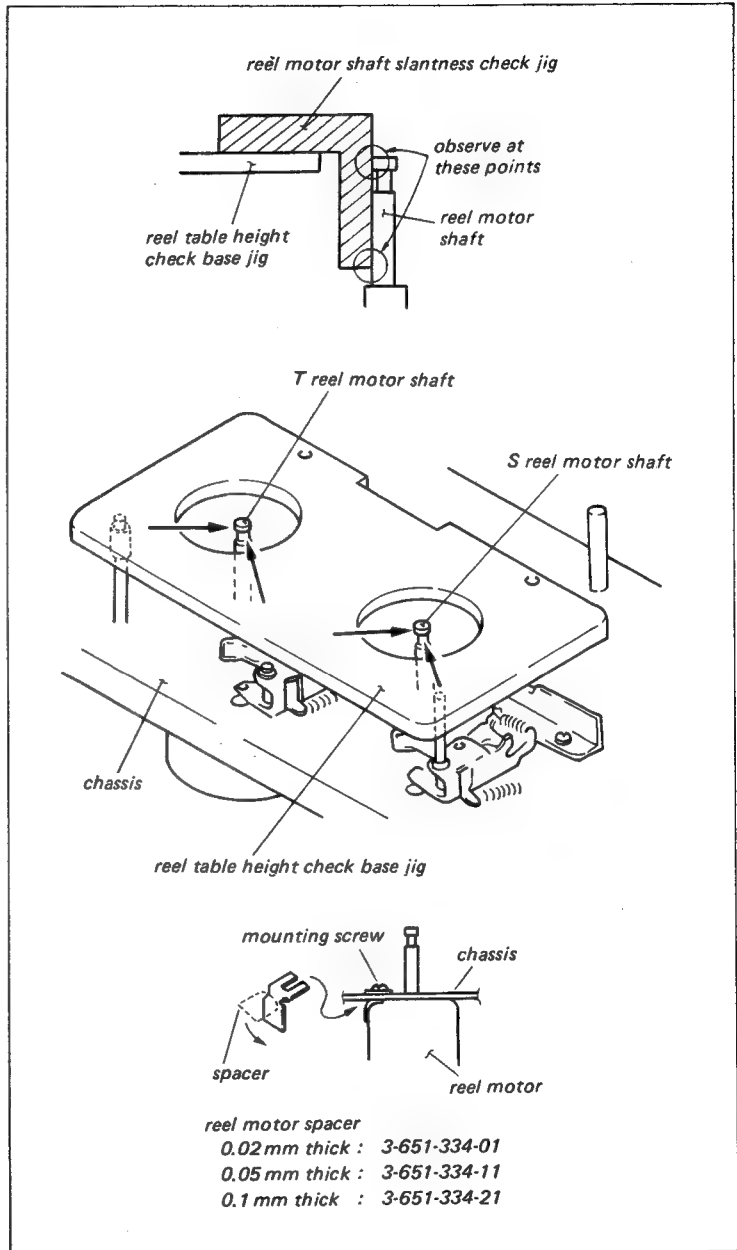
Loosen the two screws at the side of reel table and remove the reel table.

##### Check procedure:

Check that there is little clearance between the jig and the reel motor shaft at the upper or the lower portion as visual, when the reel motor shaft slantness check jig is set on the reel motor shaft from two directions as shown in figure.

##### Adjustment procedure:

Loosen the three fixing screws. Insert the reel motor spacer between the reel motor and the chassis to meet the required specification.



## 7-5. S TENSION REGULATOR ARM FF POSITION ADJUSTMENT

**Tool:** Extension board

**Mode:** STOP

### Preparation:

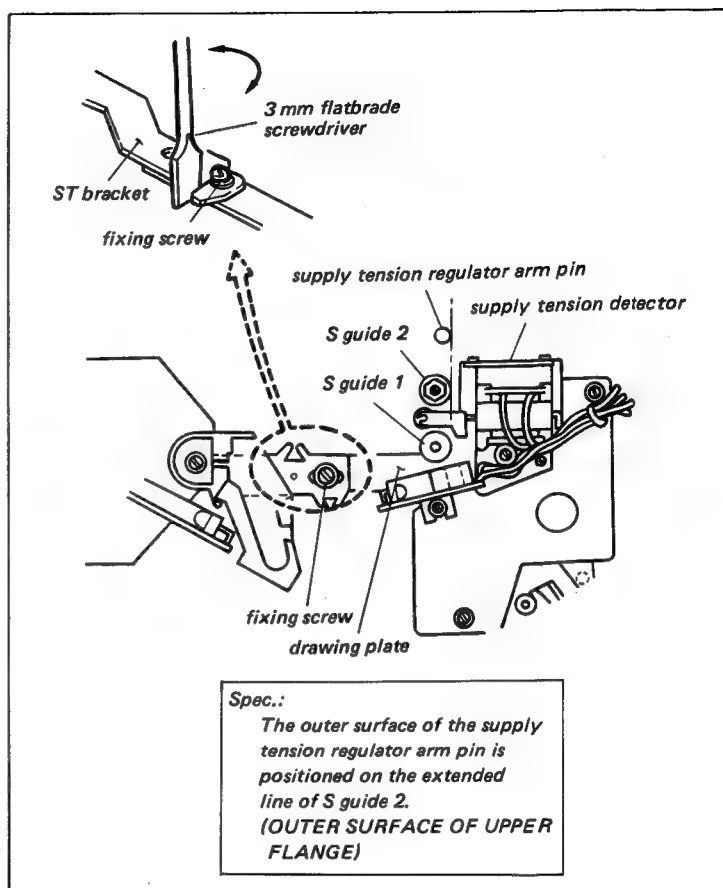
- (1) Mute the tape beginning sensor and the tape end sensor.
- (2) Mute the TAPE PROTECTION signal and the THREADING MOTOR DISABLE signal.
- (3) Turn the power on and put the machine into STOP mode. Turn the power off.

### Check procedure:

Check that the positional relationship between the S tension regulator arm pin and the S guide (2) meets the required specification.

### Adjustment procedure:

- (1) Loosen the fixing screw of the ST bracket about 1/2 turns.
- (2) Insert a flatblade 3mm screwdriver into a notch, and move the ST bracket by turning the screwdriver slowly to meet the required specification.
- (3) Tighten the screw while pressing the ST bracket against the drum.



## 7-6. SUPPLY TENSION REGULATOR ARM FWD POSITION ADJUSTMENT

**Tool:** KCS-20 cassette tape

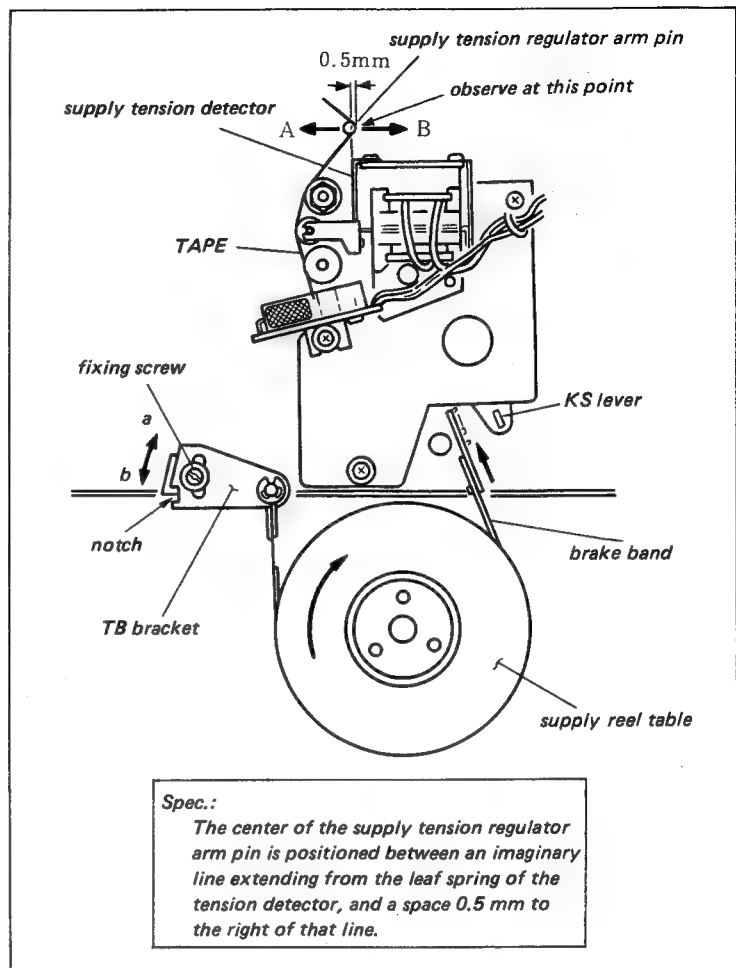
### Check procedure:

While playing back the beginning of KCS-20 cassette tape, check that positional relationship of the supply tension regulator arm pin and the supply tension detector meets the specification.

If not, perform the adjustment procedure.

### Adjustment procedure:

- (1) Remove the KCS-20 cassette tape.
- (2) Loosen the fixing screw about 1/4 turn.
- (3) Insert a flatblade 3mm screwdriver into the notch of the TB bracket, and move the TB bracket in the direction shown by the arrow. Check that the positional relationship is in the specification in the same manner as check procedure. If supply thension regulator arm pin is positioned at A side then, turn the TB bracket to "a" direction. And if it is on B side, turn it to "b" direction.
- (4) Perform FWD back tension adjustment.



## 7-7. CASSETTE-UP COMPARTMENT ADJUSTMENT

### 7-7-1. IN Switch Position Adjustment

#### Tool:

KCA-60 cassette tape

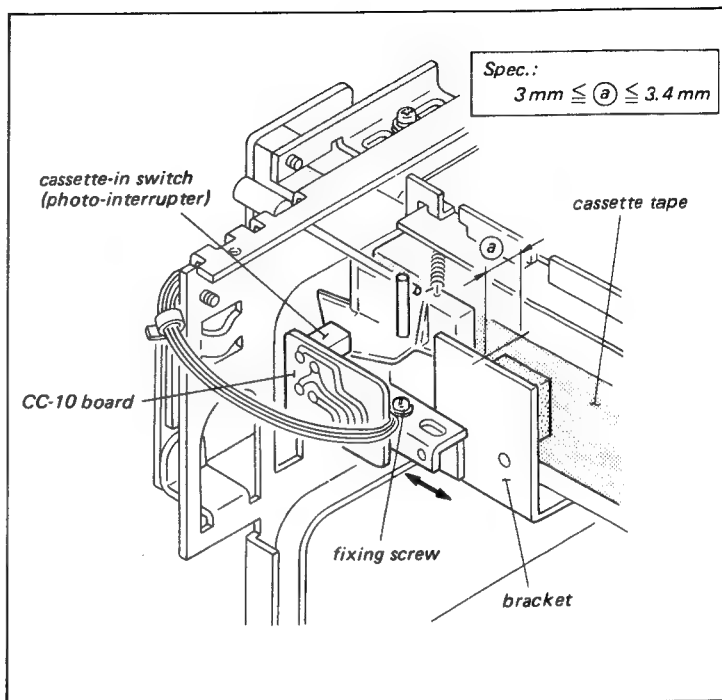
Thickness gauge

Circuit tester

#### Preparation:

- (1) Connect the connector CN19 of the harness for cassette-up compartment and the terminal on the CC-9 board with the jumper leads.

connector of harness	terminal on CC-9 board
4 pin (5 V)	4 pin/CN1
5 or 2 pin (GND)	5 or 2 pin/CN1



- (2) Turn on the power.

#### Check procedure:

- (1) Connect the circuit tester to 2 terminal on CC-9 board.
- (2) Insert a KCA-60 cassette tape slowly.
- (3) Check that the clearance between the front side of the cassette tape and the bracket of cassette-up compartment meets the required specification when the circuit tester is turned "H" level.(about 5 V)

#### Adjustment procedure:

Adjust the position of the cassette-in switch in the direction of the arrow to meet the required specification.

#### Adjusting procedure;

Insert a 3.3mm thickness gauge between cassette tape and bracket. Adjust the position of the cassette-in switch so that the tester is turned to "H" in this position.

## 7-7-2. DOWN Switch Position Adjustment

Tool: Circuit tester

### Preparation:

- (1) Connect the connector of the harness for cassette-up compartment and the terminal on CC-9 board with the jumper leads.

connector of harness	terminal on CC-9 board
4 pin (5 V) ← → 4 pin/CN1	
5 or 2 pin (GND) ← → 5 or 2 pin/CN1	

- (2) Turn on the power.

### Check procedure:

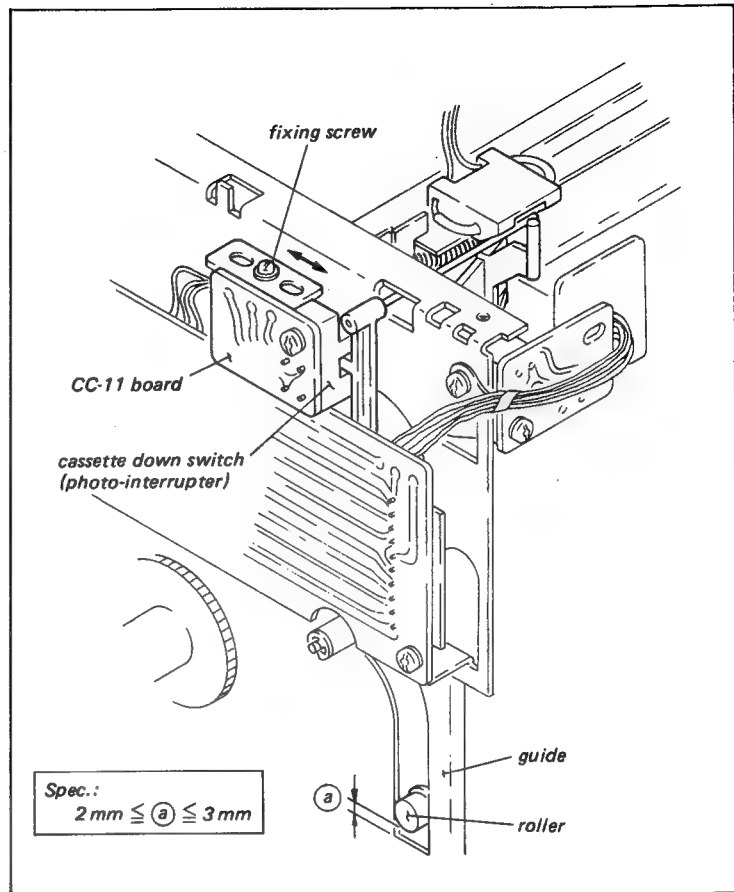
- (1) Connect the circuit tester to 5 terminal on CC-9 board.
- (2) Turn the white colored gear on the right side of the cassette-up compartment in the clock-wise direction.
- (3) When the circuit tester is turned to "H", check that the clearance between the roller and the guide meets the required specification.

### Adjustment procedure:

Adjust the position of the cassette-down switch in the direction of the arrow to meet the required specification.

Adjusting procedure;

Turn the gear on the right side so that the clearance between the roller and the guide is 2.2mm clearance. Adjust the position of the cassette-down switch so that the circuit tester is turned to "H" in this position.



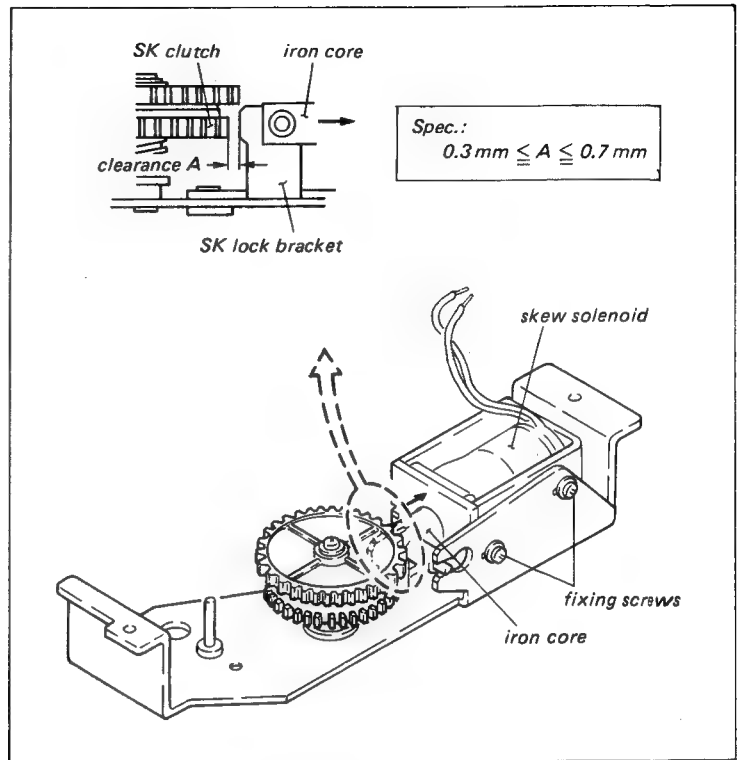
## 7-8. SKEW SOLENOID MOUNTING POSITION ADJUSTMENT

### Check procedure:

- (1) Push the iron core into the fully energized position as far as it will go.
- (2) Check that the clearance between the white colored SK clutch and SK lock bracket meets the required specification as visual.

### Adjustment procedure:

Adjust the mounting position of the skew solenoid to meet the required specification.



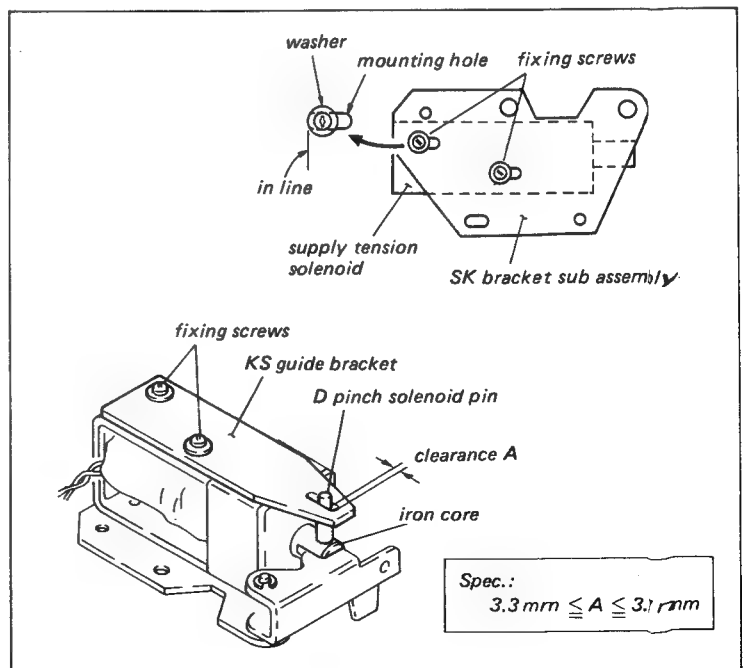
## 7-9. SUPPLY TENSION SOLENOID MOUNTING POSITION ADJUSTMENT

Remove the supply tension solenoid from the machine in this adjustment.

Tool: Thickness gauge

### Adjustment procedure:

- (1) Attach the supply tension solenoid to the KS bracket sub assembly so that meets the relationship between the washer and the bracket as shown in figure.
- (2) Push the iron core into the energized position with finger, and attach the KS guide bracket so that the positional relationship between KS guide bracket and D pinch solenoid pin meets the specification.



## 7-10. THREADING SYSTEM ADJUSTMENT

### 7-10-1. Threading Ring Rotation Adjustment

This adjustment is required only when the threading ring is replaced or removed. It is usually not required.

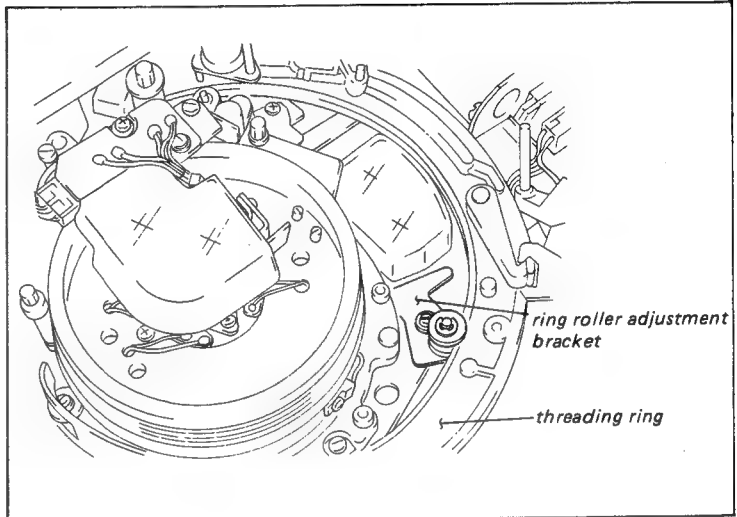
#### Adjustment procedure:

- (1) Loosen the screw of the ring sensor.
- (2) Cancel the engagement of the ring drive gear and the threading ring.
- (3) Remove the protector (R) above the ring roller adjustment bracket.
- (4) Adjust the position of the ring roller adjustment bracket to meet the required specification.

#### Adjusting procedure;

Insert a 0.3mm thick paper between the threading ring and the ring roller. Paper of this maintenance manual is 0.1mm thick so that the three fold becomes 0.3mm thick.

- (5) Check that the rotation of the threading ring is smooth when it rotates to clockwise and counterclockwise directions several times with finger.  
(If rotation becomes heavy in specific position, perform the procedure (4) in that position.)
- (6) After this adjustment, perform the sec.7-10-2 Ring Drive Gear Engagement Adjustment and sec.7-10-3 Ring Sensor Position Adjustment.





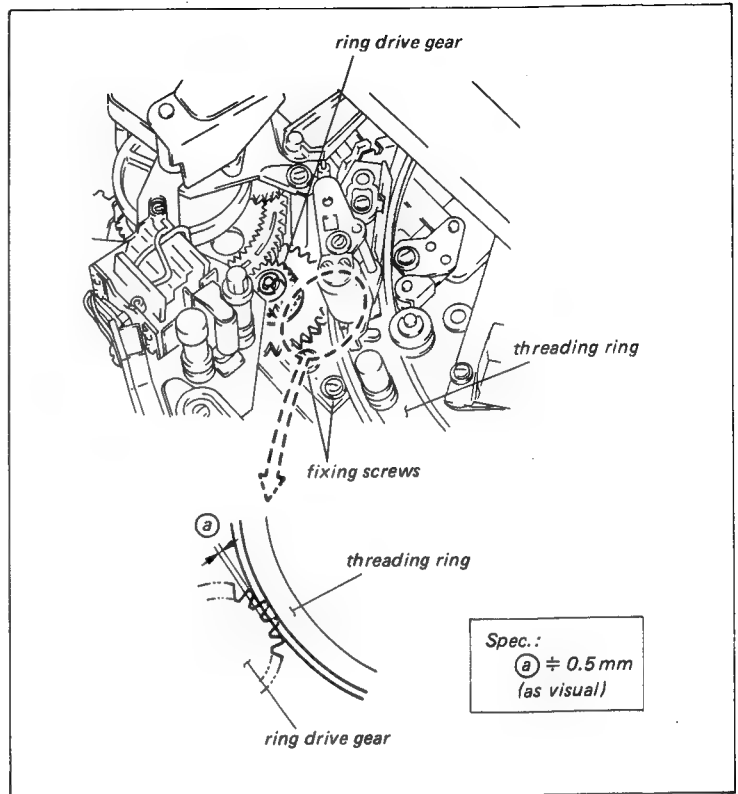
### 7-10-2. Ring Drive Gear Engagement Adjustment

**Mode:**

Engage the 5th guide in the V guide to turn the pulley of threading motor with finger.

**Adjustment procedure:**

- (1) Adjust the ring drive gear position so that the positional relationship between the ring drive gear and the threading ring meets the required specification.
- (2) Repeat the threading/unthreading mode two or three times and check that the rotation are smooth.
- (3) After adjustment, perform the Ring Sensor Position Adjustment.

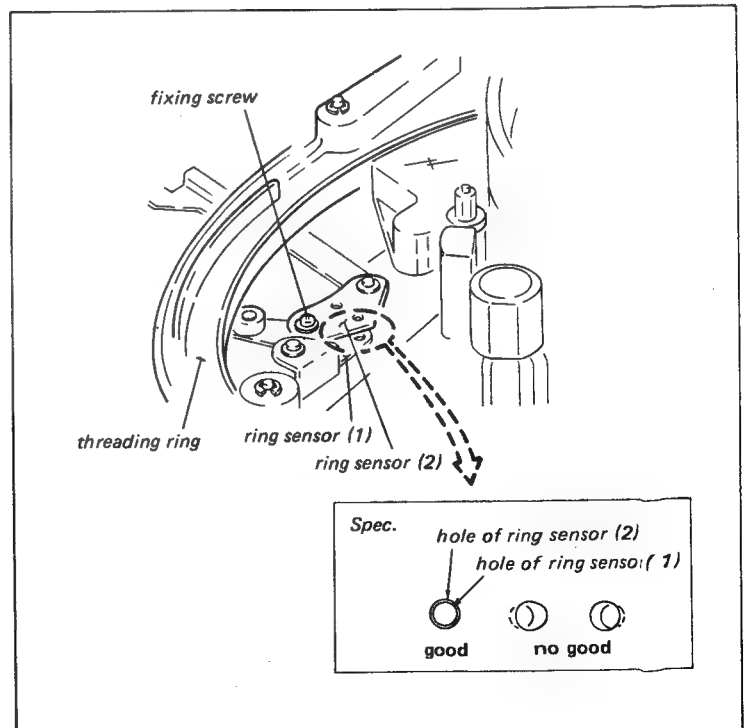


### 7-10-3. Ring Sensor Position Adjustment

**Mode:**EJECT completion

**Adjustment procedure:**

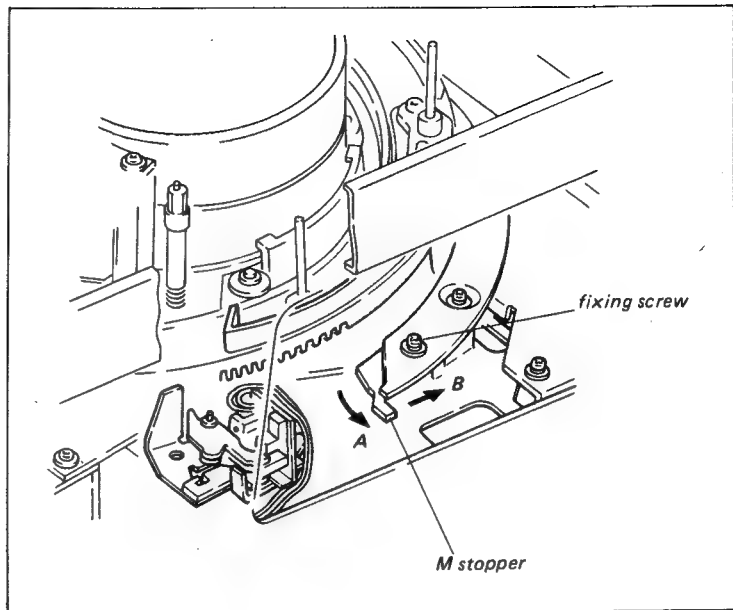
Remove the screw and put the ring sensors (1) and (2) so that the positional relationship of their holes meets the required specification.



#### 7-10-4. M Stopper Mounting Position Adjustment

##### Adjustment procedure:

Install the M stopper to put aside the A and B directions as far as it will go.



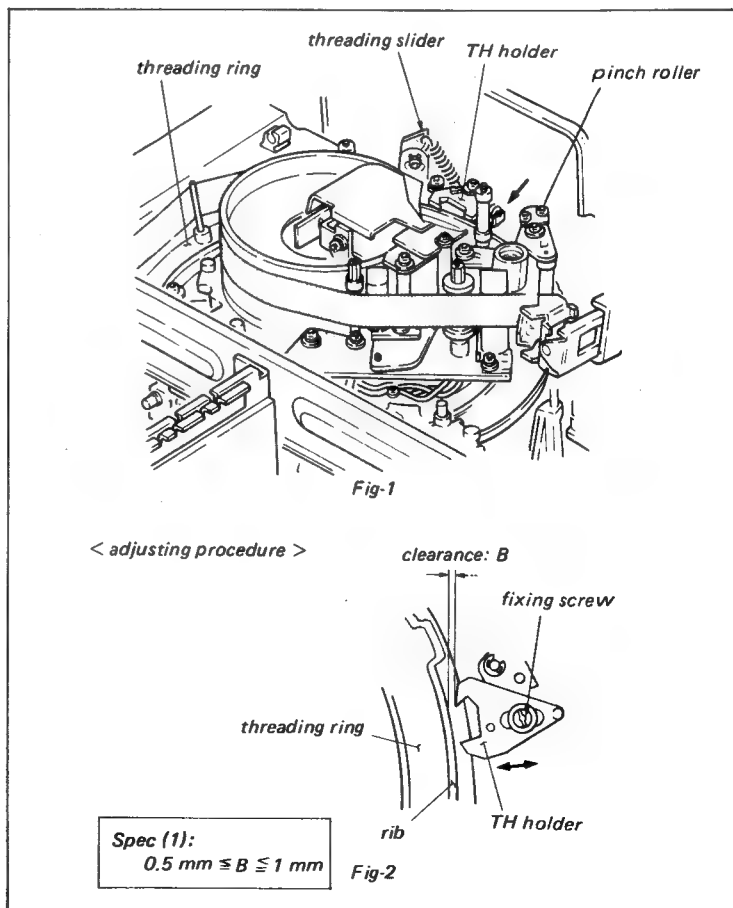
#### 7-10-5. TH Holder End Position Adjustment

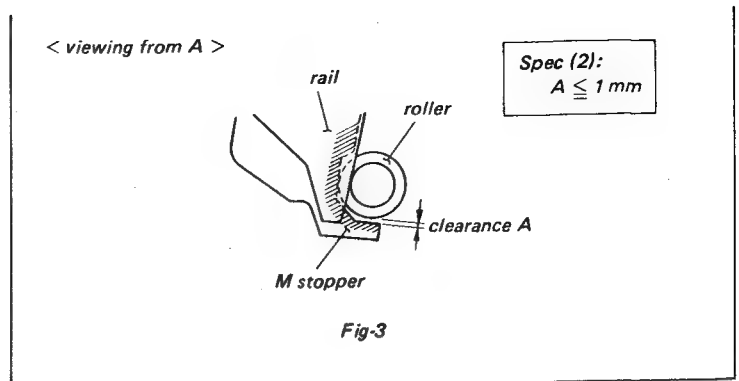
##### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the end portion of the tape).
- (2) Turn off power in the moment when the pinch roller comes in front of the audio/CTL head.
- (3) Check that the clearance B meets the required specification (1) as shown in Fig.2. If not, perform the following adjustment.
- (4) Turn on power. Put the machine into the STOP mode.
- (5) Check that the positional relationship between the roller and the M stopper meets the required specification (2) as shown in Fig.3.
- (6) Repeat the EJECT and STOP modes two or three times. Check as procedure (5).

##### Adjustment procedure:

- (1) Adjust the position of the TH holder to meet the required specification (1).
- (2) After adjustment, check as procedures (4) to (6) of check procedure.



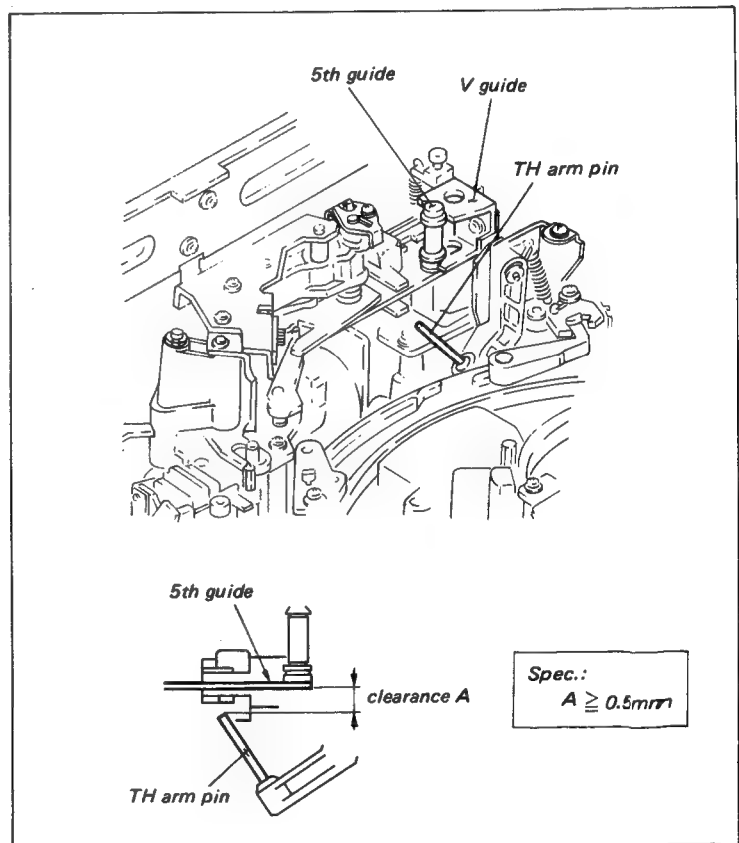


### 7-10-6. Threading Slider EJECT Position Adjustment

Mode:EJECT completion

#### Check procedure:

Check that the clearance between the 5th guide and the TH arm pin meets the required specification.



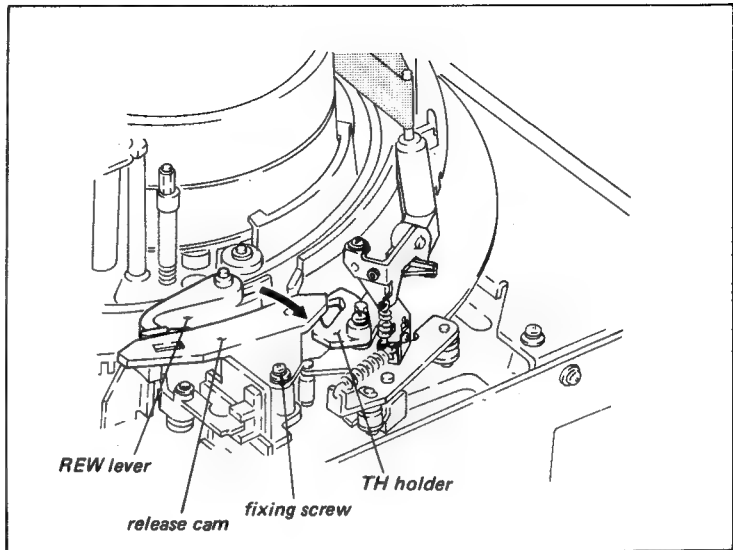
### 7-10-7. Release Cam Installing Position Adjustment

#### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the beginning portion of the tape) and put the machine into the STOP mode.
- (2) After turn off the power, turn on again and put the machine into unthreading mode.
- (3) Check that the REW lever lockes to the TH holder.

#### Adjustment procedure:

- (1) Adjust the position of the release cam in the direction of the arrow so that meets the specification.
- (2) After this adjustment, check as the check procedure.



### 7-10-8. Photo Coupler Cover Height Adjustment

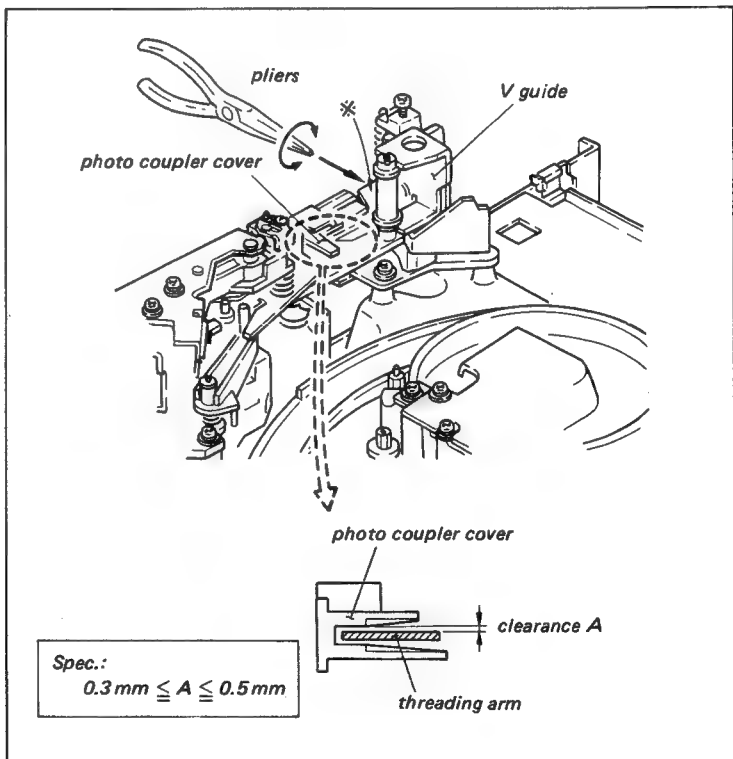
Mode:STOP

#### Check procedure:

Check that the clearance between the threading arm and the photo coupler cover meets the required specification.

#### Adjustment procedure:

Adjust to bend the \* marked portion of the V guide with pliers.



### 7-10-9. 5th Guide Operating Position Adjustment

Tool:KCS-20 cassette tape

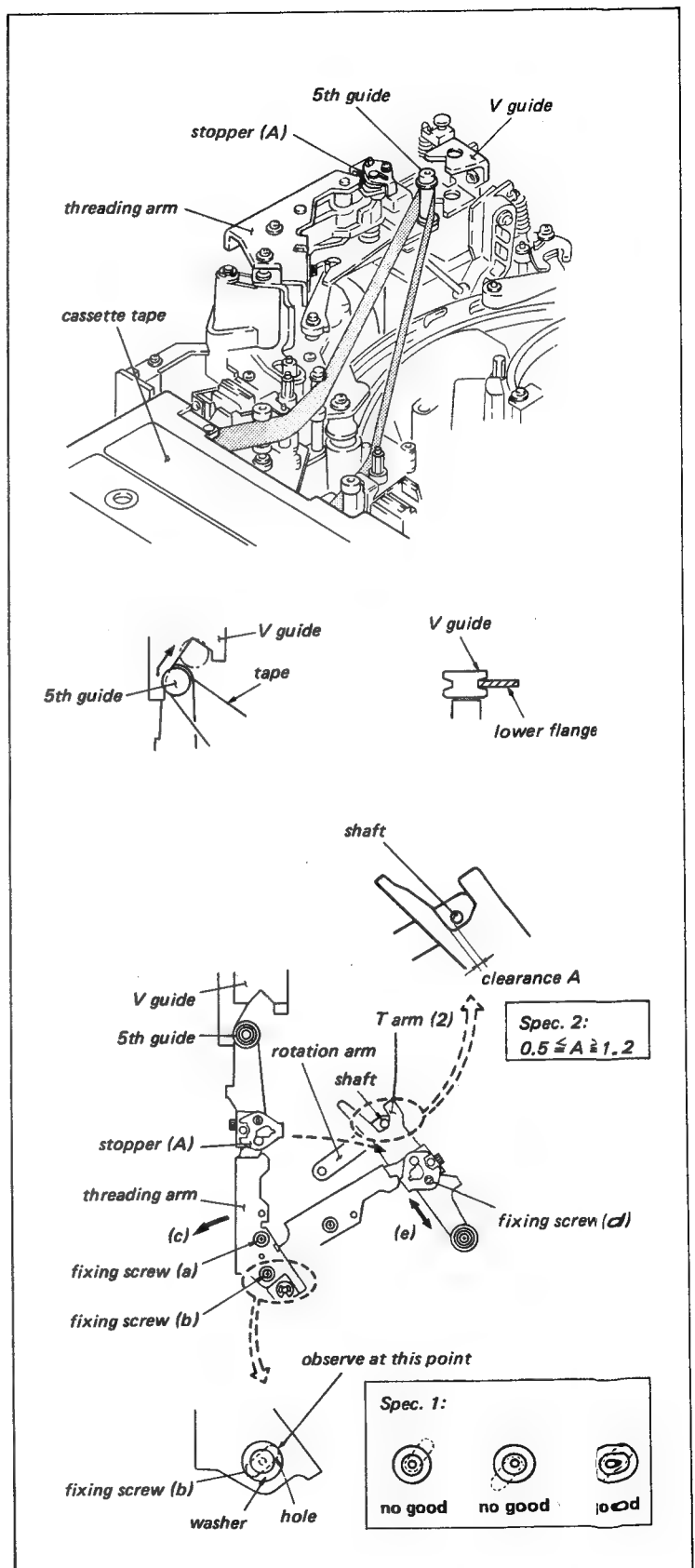
Mode:STOP↔EJECT

### Check procedure:

- (1) Energize the tape beginning/end sensors.
- (2) Put the KCS-20 cassette-tape (use the end portion of the tape). Turn the T reel hub in the counterclockwise direction with finger as far as it will go.
- (3) Insert the cassette-tape to the machine in the power off mode.
- (4) Turn on the power and put the machine into the threading mode. Check that the 5th guide fits the V guide as shown in figure.
- (5) Repeat the EJECT and STOP modes several times. Check again.

### Adjustment procedure:

- (1) Remove the cassette tape.
- (2) Put the machine into STOP mode. Put the 5th guide on the position as shown in figure according to turn the pulley of threading motor with finger.
- (3) Loosen the fixing screws (a) and (b), and slide the threading arm in the direction of the arrow (c). Adjust the position of threading arm so that the relationship between the washer of screw (b) and screw hole of threading arm meets the specification (1).
- (4) Turn the pulley of threading motor so that the T arm (2) is in the position as shown in figure.
- (5) Loosen the fixing screw (d) and then slide the stopper (A) in the direction of the arrow (e). Adjust that the positional relationship of the rotation arm shaft and the T arm (2) meets the specification (2) as shown in figure, and tighten the screw.



## 7-10-10. 5th Guide Unthreading Position Adjustment

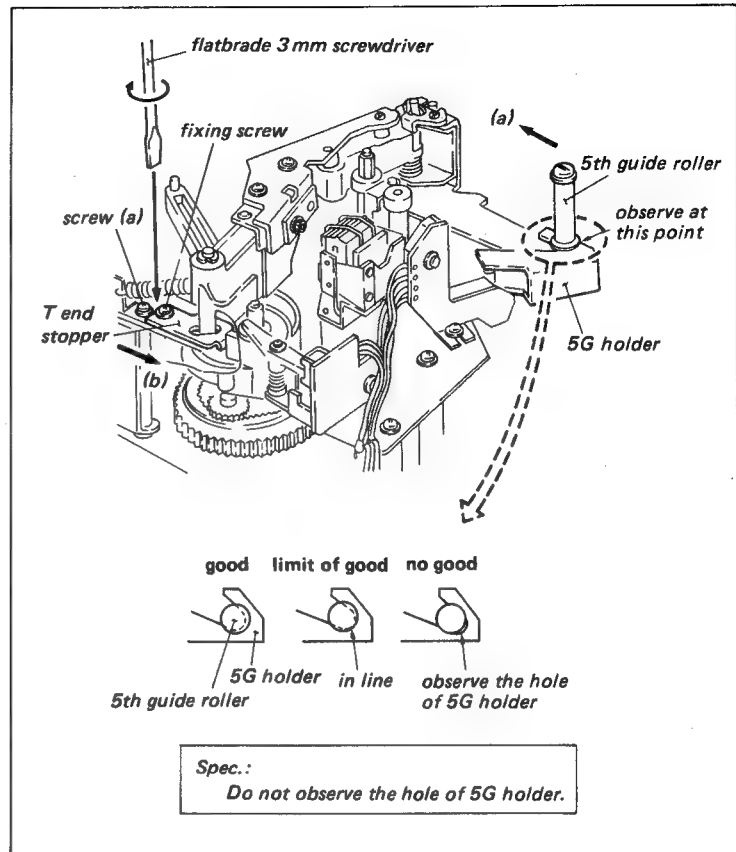
Mode: STOP EJECT completion

### Check procedure:

- (1) Put the machine into STOP mode once and put into EJECT completion mode by pushing EJECT button.
- (2) Check that the clearance between the 5th guide and the 5G holder meets the required specification.

### Adjustment procedure:

- (1) Put the machine into the EJECT completion mode.
- (2) Loosen the fixing screw about two turns.
- (3) Rotate the pulley of the threading motor two or three turns so that the 5th guide roller fits into the 5G holder.
- (4) Tighten the fixing screw once, and loosen it about 1/2 turn.
- (5) Insert a flatbrade 3mm screwdriver between the T end stopper and the screw (a) and turn the screwdriver in the direction of the arrow. Move the T end stopper in the direction of the arrow (b) with the screwdriver until the 5th guide roller gets to move in the direction of the arrow (a) and tighten the screw.



### 7-10-11. T End Sensor Position Adjustment

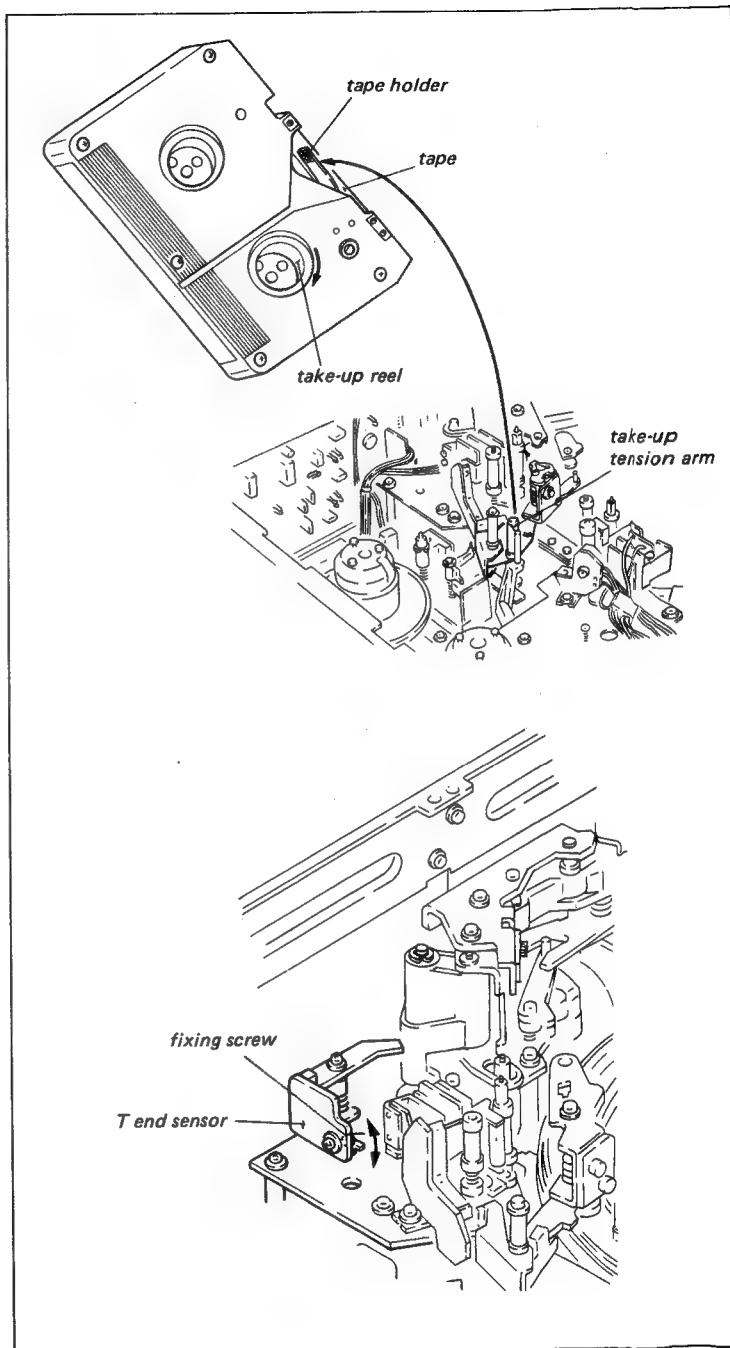
Tool: KCS-20 or KCA-60 cassette tape

#### Check procedure:

- (1) Turn off the power.
- (2) Turn the take-up reel hub of cassette tape with finger, and remove the slack of tape.
- (3) Fully open the lid of cassette tape and insert the cassette tape so that the take-up tension arm is placed between the cassette tape and the tape holder.
- (4) Turn the pulley of the gear box and bring the take-up tension arm into contact with the tape.
- (5) Turn on the power. Check that the machine is putted into the threading mode after the take-up tension arm moves toward the reel table side once.

#### Adjustment procedure:

Adjust the position of the T end sensor to meet the required specification.



## 7-10-12. Take-up Tension Arm, Unthreading Position Adjustment

**Tool:**KCS-20 or KCA-60 cassette tape

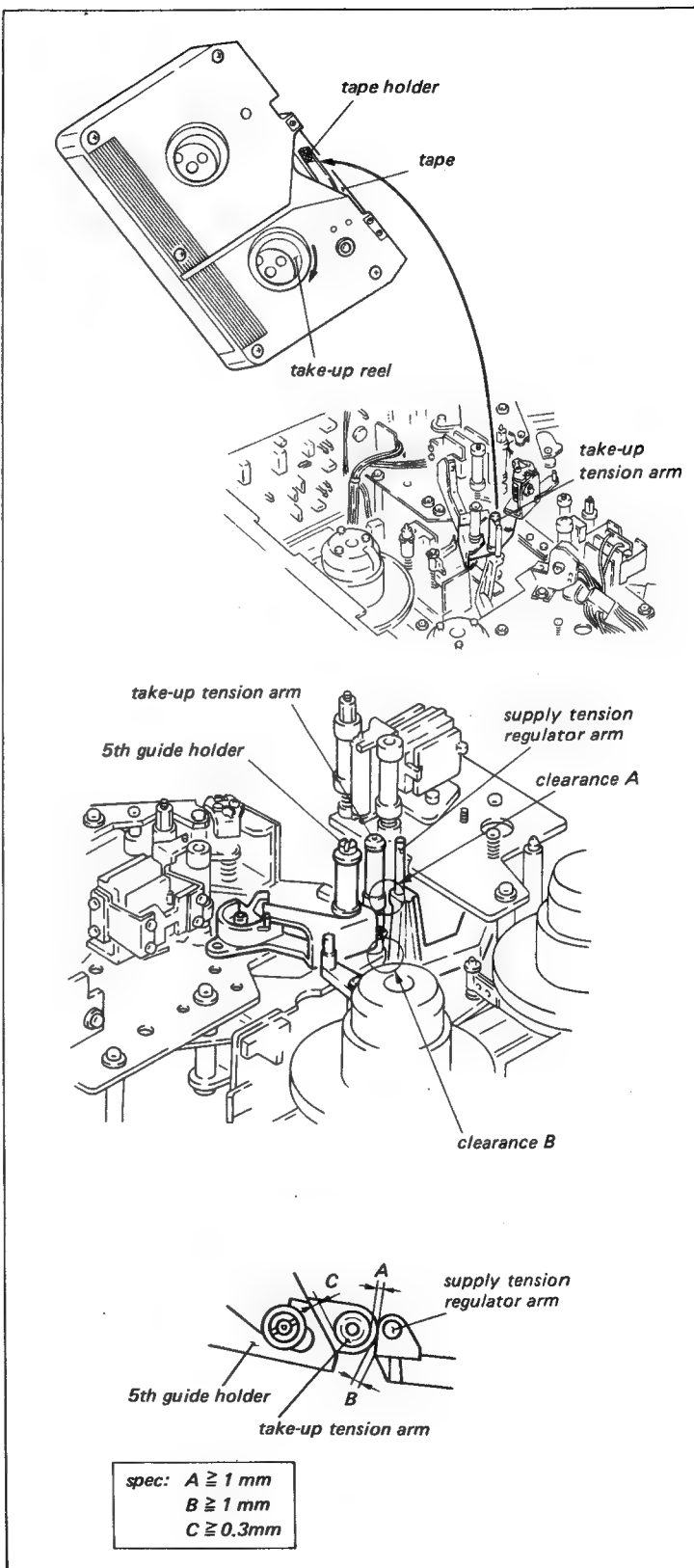
**Mode:**EJECT completion

### Check procedure:

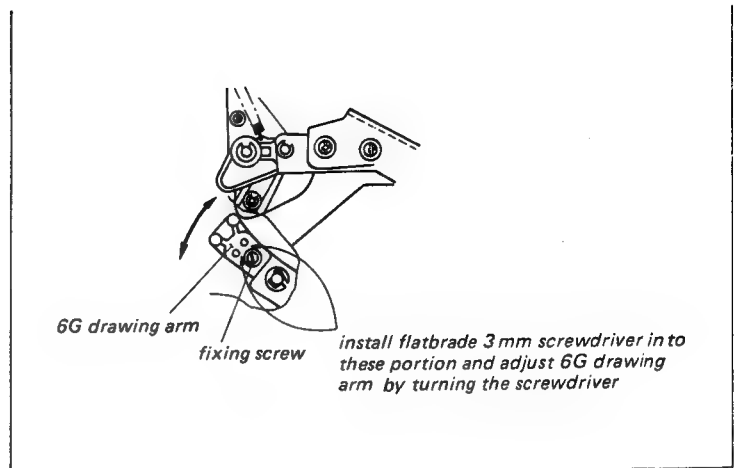
- (1) Turn the take-up reel hub of cassette tape with finger, and remove the slack of tape.
- (2) Fully open the lid of cassette tape and insert the cassette tape so that the take-up tension arm is placed between the cassette tape and the tape holder.
- (3) Check that the tape does not contact with the take-up tension arm.
- (4) Check that the positional relationship of the take-up tension arm, 5th guide holder and the S tension regulator arm meets the required specification.

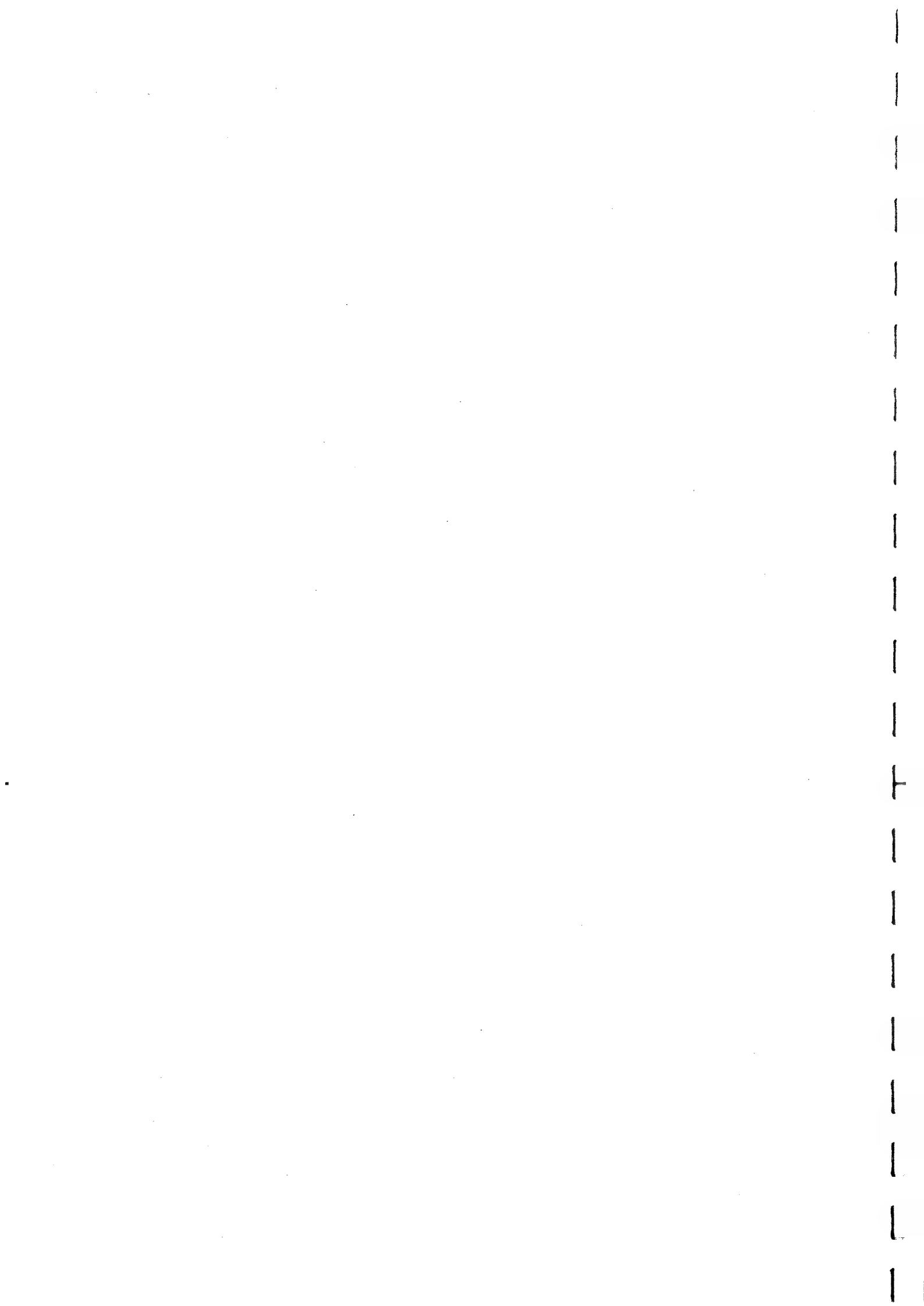
### Adjustment procedure:

Adjust the position of the 6G drawing arm to meet the required specification.









## SECTION 8

### BACK TENSION AND TORQUE ALIGNMENT

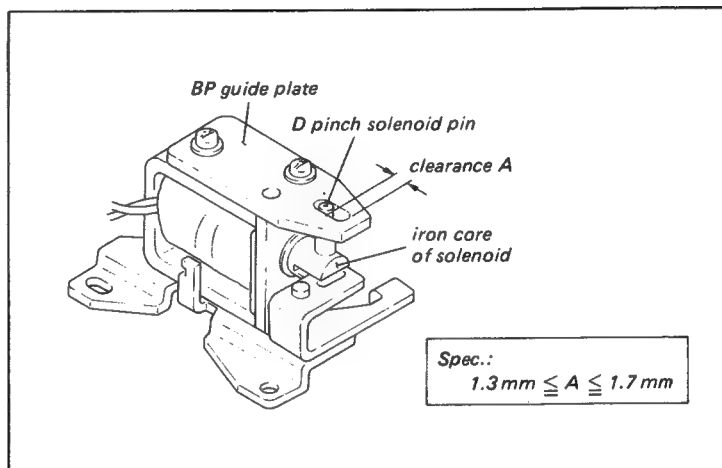
#### 8-1. BRAKE SOLENOID MOUNTING POSITION ADJUSTMENT

This machine has the brake solenoid independently for the supply and the take-up reel tables. Adjusting procedures of the supply and the take-up sides in the same way.

**Tool:** Thickness gauge

##### **Adjustment procedure:**

After the iron core of the solenoid is pushed with finger to set up the energized state, adjust the position of the BP guide plate to meet the required specification.



#### 8-2. BRAKE LEVER ADJUSTMENT

This machine has the reel brake independently for the supply and the take-up reel tables. Perform this adjustment independently for the T reel brake and the S reel brake.

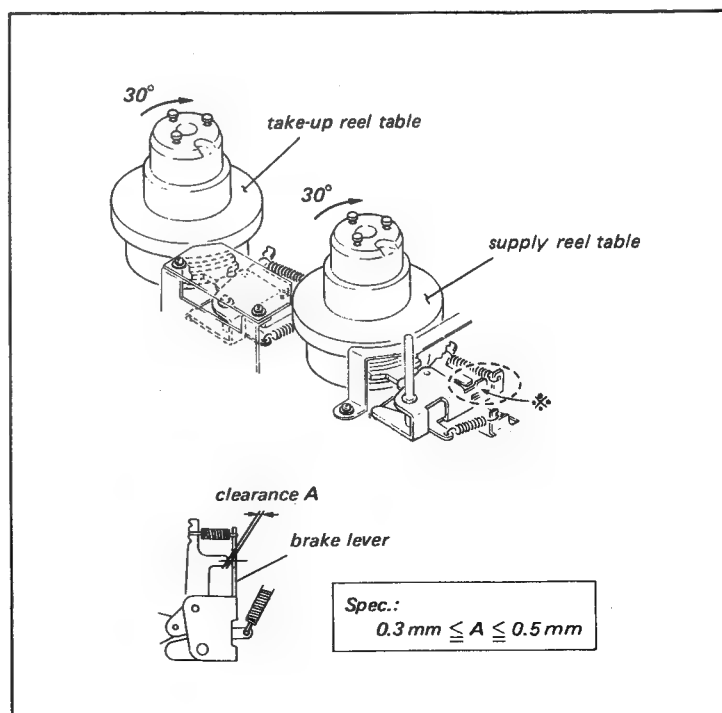
**Mode:** EJECT completion

##### **Check procedure:**

Grasp the reel table by hand and turn to the clockwise direction about 30 degrees. Check the clearance A to meet the required specification.

##### **Adjustment procedure:**

Bend the \* marked portion of the brake lever to meet the required specification with a pliers.



### 8-3. BRAKE TORQUE ADJUSTMENT

This machine has the reel brake independently for the supply and the take-up reel tables. Perform this adjustment independently for the T reel brake and the S reel brake.

**Tool:**

Reel table torque measurement tape  
(100 mm dia.)

Tension scale (200 g full scale)

**Preparation:**

Remove the handle bracket on the right side of the set.

**Mode:**EJECT completion

**Check procedure:**

Install the jig tape on the reel table. Pull out the tape at a constant speed of approx 9.5 cm/sec. and confirm that the scale reading is in the specification.

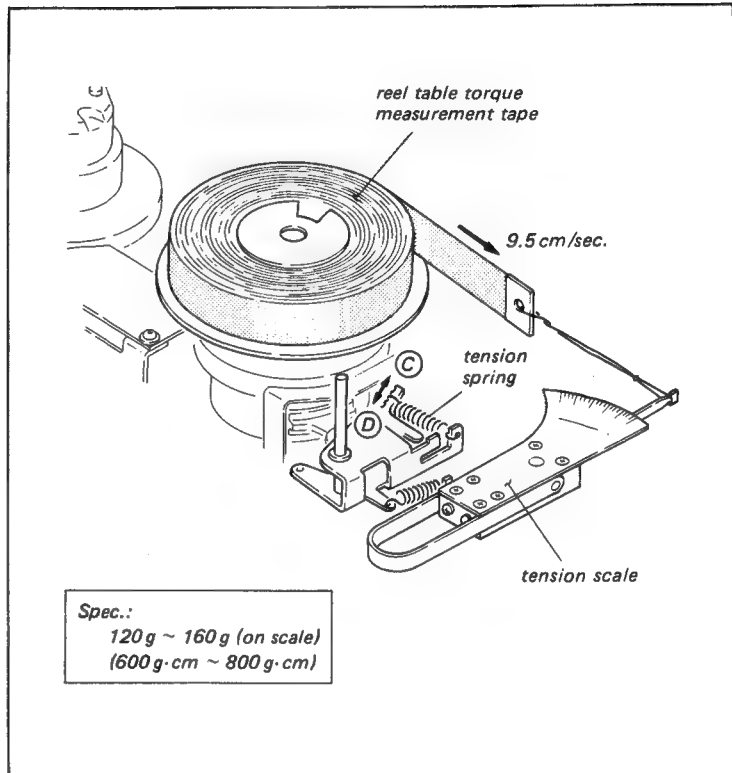
**Adjustment procedure:**

- (1) Select the proper spring hook to meet the specification.

Ⓒ direction: increases brake torque

Ⓓ direction: decrease brake torque

- (2) It is not to meet the specification, replace the brake shoe.



#### 8-4. FWD BACK TENSION ADJUSTMENT

##### Tool:

Back tension adjustment jig  
Reel table torque measurement tape  
(100 mm dia.)  
Tension scale (100 g fullscale)  
Allen wrench (each edge has 2 mm)

##### Preparation:

- (1) Mute the tape beginning sensor and tape end sensor.
- (2) Mute the TAPE PROTECTION and the THREADING MOTOR DISABLE signals.
- (3) Open the connector panel. Disconnect all connectors of the RP-10 board and remove the RP-10 board from the chassis.
- (4) Turn on the power and put the machine into PLAY mode.
- (5) Set the SKEW control knob to its center click (detent) position.
- (6) Install the back tension adjustment jig.
- (7) Install the jig tape on the supply reel table and thread a tape as shown in figure.

##### (CAUTION)

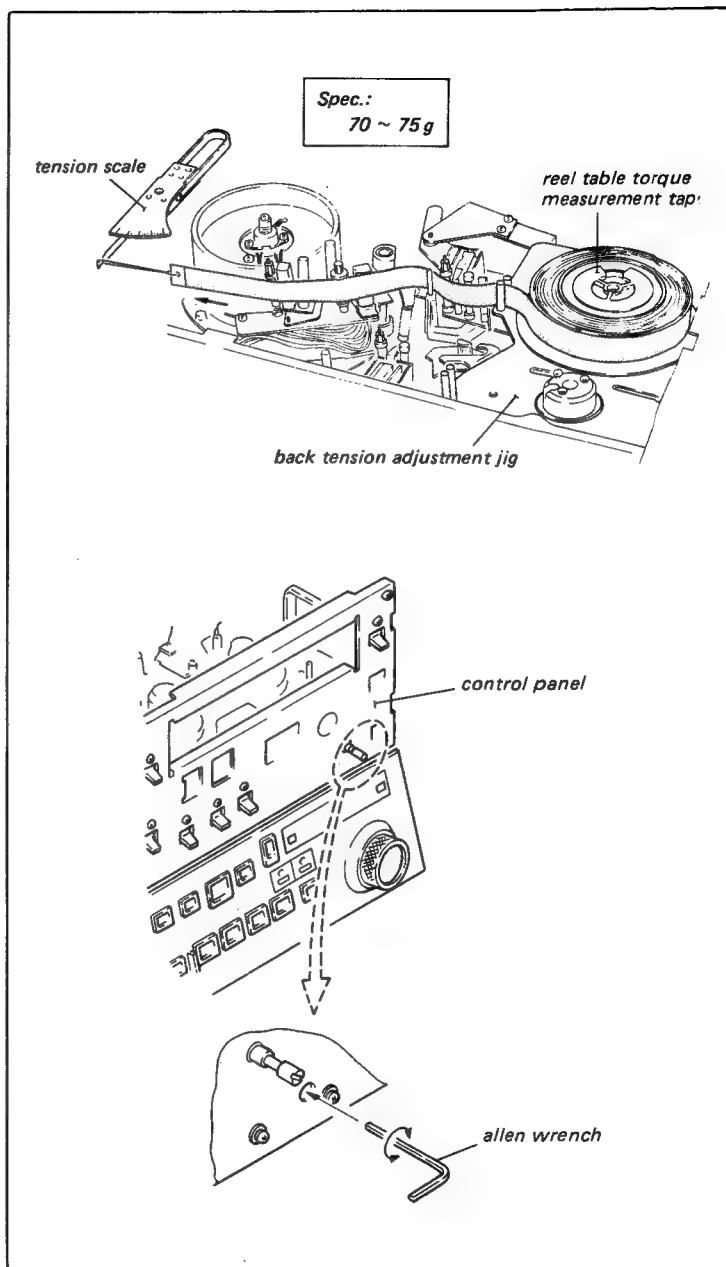
Take care that the head drum is rotating in a high speed.

##### Check procedure:

- (1) Hook a tension scale on an end of the tape. Pull out the tape at a constant speed of approx 9.5 cm/sec. and confirm that the scale reading is in the specification.
- (2) After check and adjustment, remove the jig tape and back tension adjustment jig. Press the EJECT button.

##### Adjustment procedure:

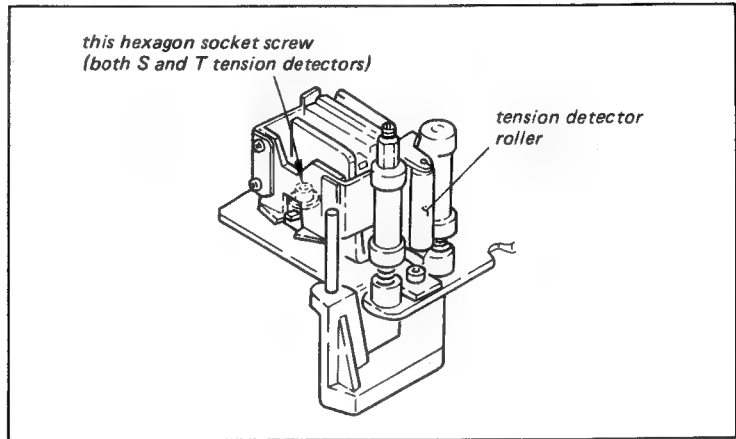
- (1) Insert the allen wrench into the hole on the control panel as shown in figure. And turn the hexagon socket screw to meet the adjustment specification.
- (2) If it is not to meet the specification, replace the brake band assembly.



## 8-5. TENSION DETECTOR ADJUSTMENT

### (CAUTION)

Do not loosen the screw as in figure. The position of tension detector roller is determined by this screw. This screw is adjusted precisely with a jig in the factory.



### 8-5-1. Tension Detector Stopper Position Adjustment

This adjustment is required only when the tension detector is replaced or removed. This stopper controls the operating range of the tension detector.

If this adjustment is poor, the optimum tape tension and the normal tape movement being not expected.

This machine has tension detectors at the supply and the take-up reel sides. The adjustment procedure described is only for the take-up side but can be applied on the operation at the supply side.

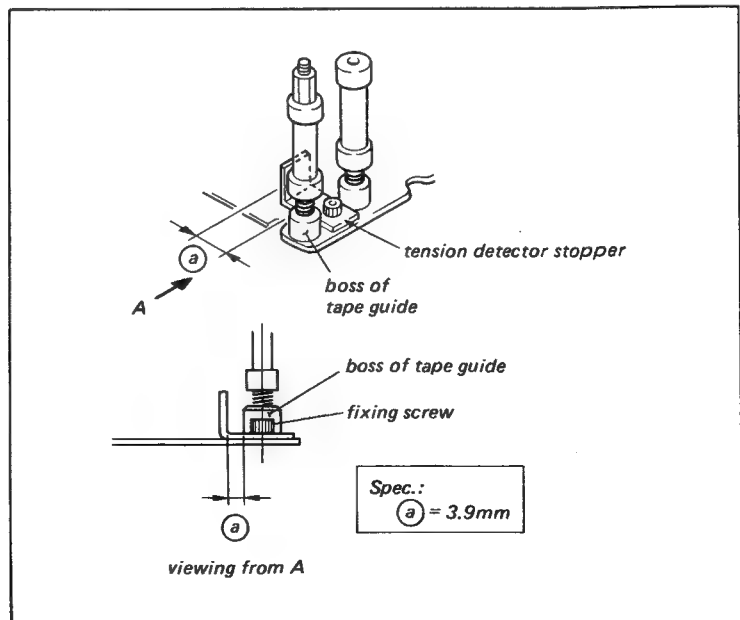
**Tool:** Slide vernier caliper or equivalent

#### Check procedure:

Check that the positional relationship between tape guide shaft and stopper to meet the specification.

#### Adjustment procedure:

Adjust the position of the stopper to meet the required specification.



### 8-5-2. T Tension Detector Roller Zenith Adjustment

This adjustment is performed to install the tension detector in the machine.

#### Tool:

Allen wrench (each edge has 2 mm)  
Flatness plate

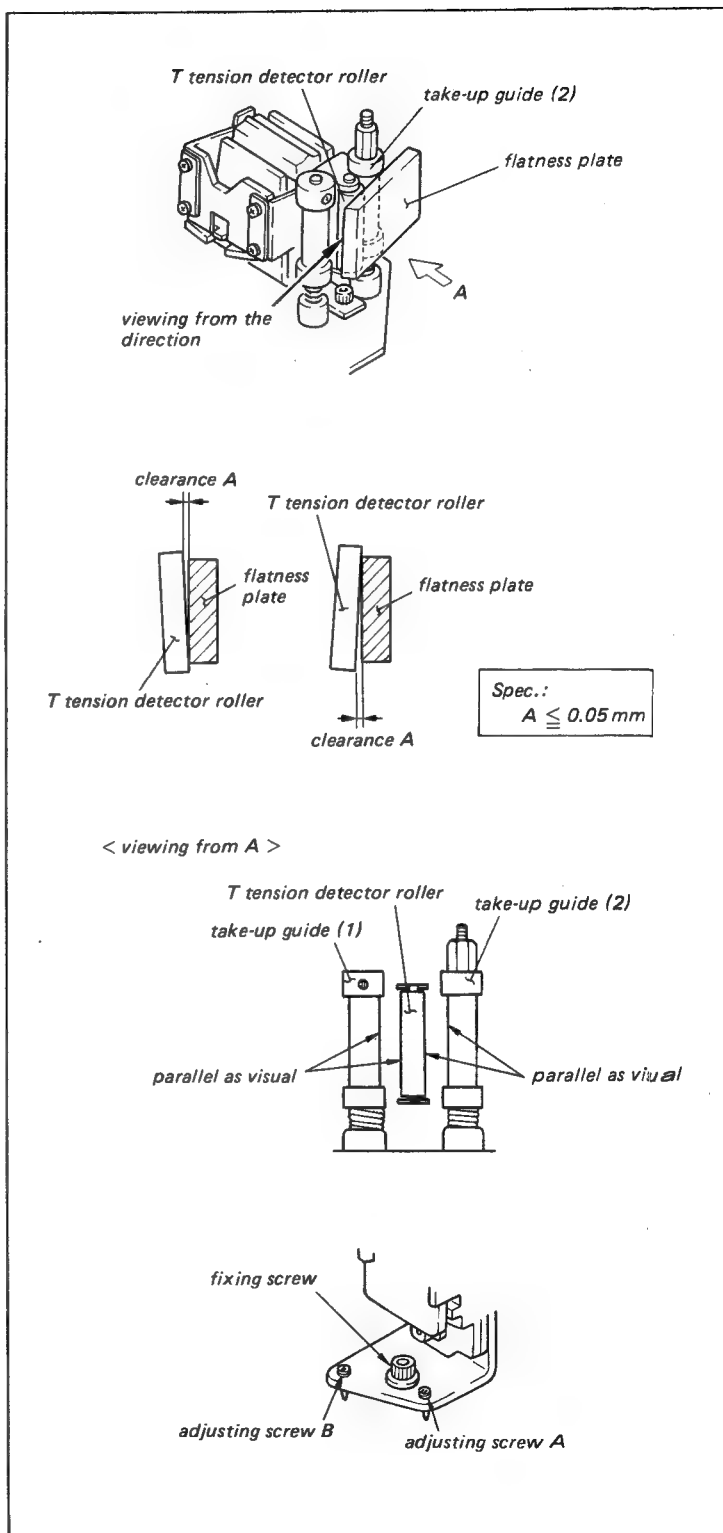
Mode:STANDBY

#### Check procedure:

- (1) Check that the clearance between the detector roller and the flatness plate meets the required specification, when the flatness plate is set on the take-up guide (2) as shown in figure and the flatness plate is touched lightly with the T tension detector roller.
- (2) Check that the tension detector roller parallels with the take-up guide (1) and (2) viewing from the direction of the arrow A.

#### Adjustment procedure:

- (1) If the check procedure (1) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screw (A) in clockwise direction. Tighten the fixing screw and check zenith again.  
When the clearance is out of spec. at the bottom portion, turn the adjusting screw (A) in counterclockwise direction. Tighten the fixing screw and check zenith again.
- (2) If the check procedure (2) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screws (A) and (B) of exactly equal amount in clockwise direction. Tighten the fixing screw and check zenith again.



When the clearance is out of spec. at the bottom portion, turn the adjusting screws (A) and (B) of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check zenith again.

### 8-5-3. S Tension Detector Roller Zenith Adjustment

This adjustment is performed to install the tension detector in the machine.

#### Tool:

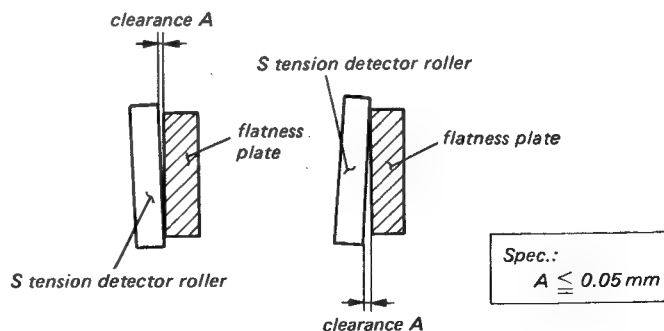
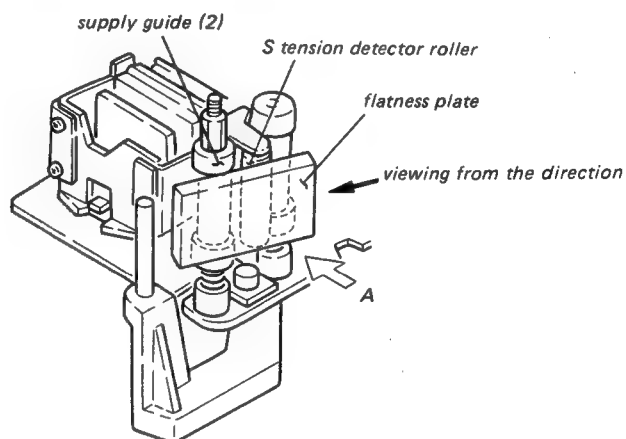
Flatness plate

Allen wrench (each edge has 2 mm)

Mode:STANDBY

#### Check procedure:

- (1) Check that the clearance between the detector roller and the flatness plate meets the required specification, when the flatness plate is set on the supply guide (2) as shown in figure and the flatness plate is touched lightly with the S tension detector roller
- (2) Check that the tension detector roller parallels with the supply guide (1) and (2) viewing from the direction of the arrow A.





**Adjustment procedure:**

- (1) If the check procedure (1) is out of specification.

When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screw (A) in clockwise direction.

Tighten the fixing screw and check zenith again.

When the clearance is out of spec. at the bottom portion, turn the adjusting screw (A) in counterclockwise direction. Tighten the fixing screw and check zenith again.

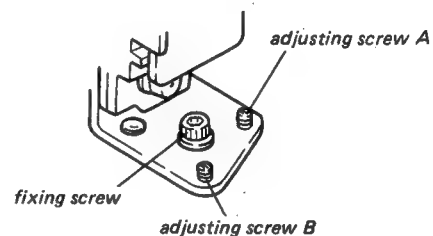
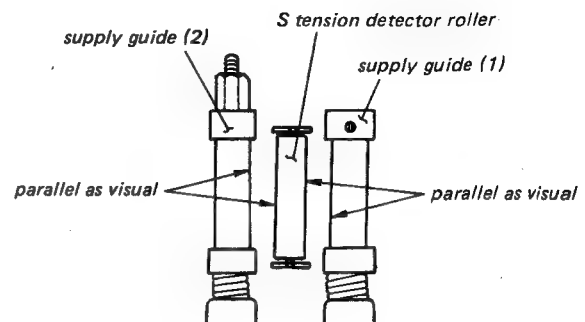
- (2) If the check procedure (2) is out of specification.

When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screws (A) and (B) of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check zenith again.

When the clearance is out of spec. at the bottom portion, turn the adjusting screws (A) and (B) of exactly equal amount in clockwise direction.

Tighten the fixing screw and check zenith again.

< viewing from A >



## 8-6. OPERATION CHECK AND ADJUSTMENT OF TENSION DETECTOR

The operational points of the supply side and take-up side tension detectors are determined at the two points i.e. the 0 g tape tension point and the 100 g tape tension point. Here the check and adjustment for operational point are described.

### 8-6-1. Supply Tension Detector 0 Gram Point Adjustment

**Mode:**EJECT

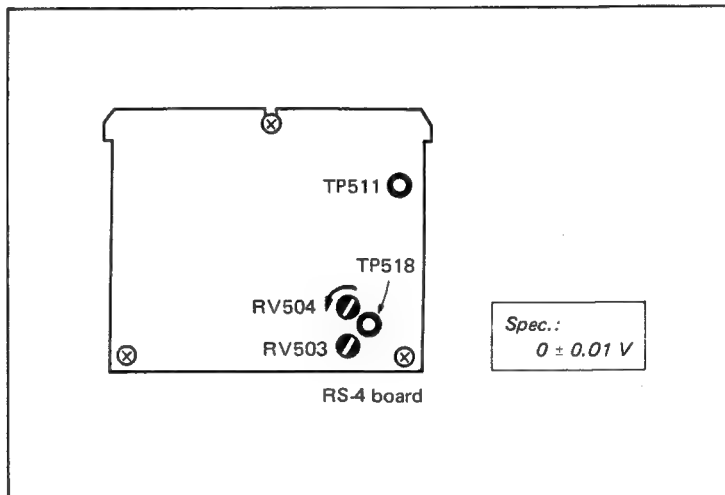
**Tool:**

Extension board

DC voltmeter (Digital multimeter)

**Preparation:**

- (1) Turn the RV504/RS-4 board to the counterclockwise direction as far as it will go. Do not turn these variable resistors except when the RS-4 board replacement is performed.
- (2) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter from TP518/ RS-4 board.
- (3) Turn on the power.



**Check procedure:**

Check that the indication of DC voltmeter meets the required specification.

**Adjustment procedure:**

Adjust the RV503/RS-4 board to meet the required specification.

### 8-6-2. Take-up Tension Detector 0 Gram Point Adjustment

Mode:EJECT

**Tool:**

Extension board

DC voltmeter (Digital multimeter)

**Preparation:**

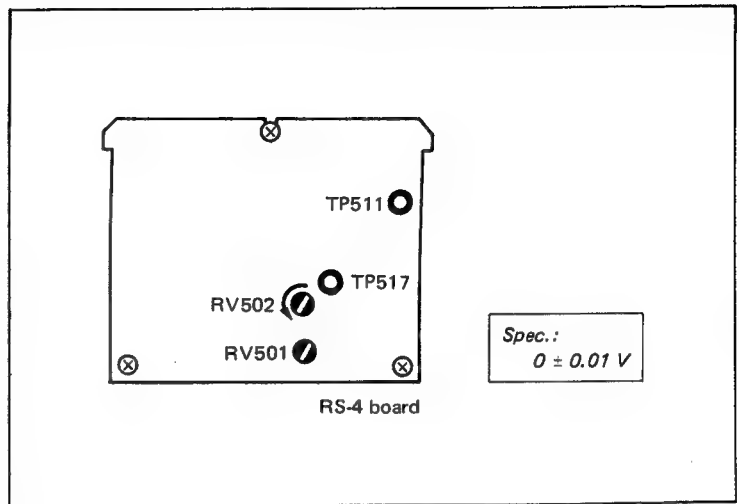
- (1) Turn the RV502/RS-4 board to the counterclockwise direction as far as it will go. Do not turn these variable resistors except when the RS-4 board replacement is performed.
- (2) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter to TP517/RS-4 board.
- (3) Turn on the power.

**Check procedure:**

Check that the indication of DC voltmeter meets the required specification.

**Adjustment procedure:**

Adjust the RV501/RS-4 board to meet the required specification.



### 8-6-3. Supply Tension Detector 100 Gram Point Adjustment

**Mode:**STANDBY

**Tool:**

DC voltmeter (Digital multi-meter)

Locally-Specially-Made-Tape  
(prepare this tape referring follows)

Cut a tape into 20 cm long. Attach an adhesive tape on an end of the tape as shown in figure. Make a hole on the adhesive tape. Make a loop of 6 cm long string through the hole. Make a circle about 1 cm dia. from another end of the tape and fix the tape by a adhesive tape.

Tension scale (100 g full scale)  
Extension board

**Preparation:**

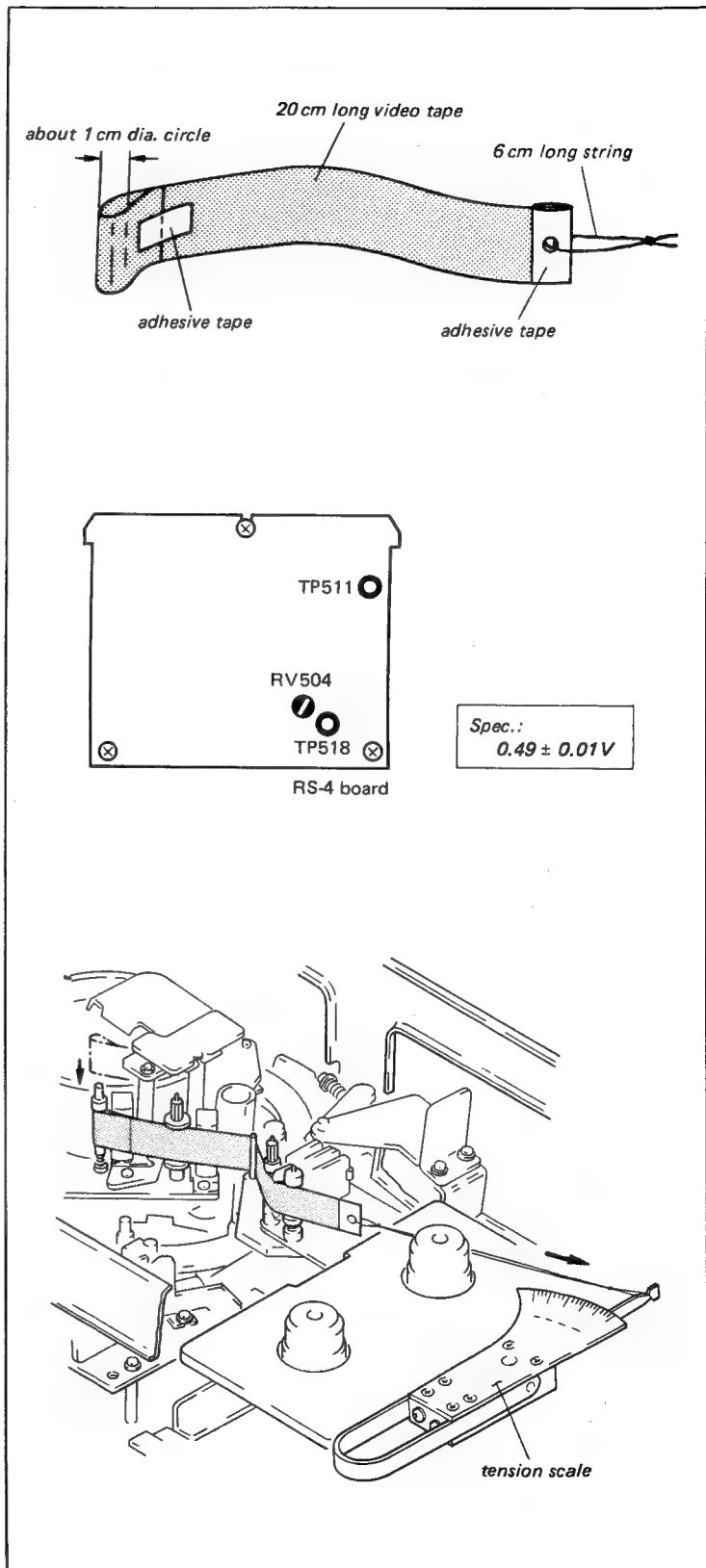
- (1) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter to TP518/RS-4 board.
- (2) Mute the tape beginning sensor and tape end sensor.
- (3) Mute the TAPE PROTECTION and the THREADING MOTOR DISABLE signals.
- (4) Put the machine into the STOP mode. Grasp the take-up and supply reel tables by hand and press the STANDBY button.

**Check procedure:**

- (1) Thread the special jig tape as shown in figure, and hook a tension scale on an end of the tape.
- (2) Move the tension scale slowly to as shown in figure direction and sets the scale  $100 + 5$  g. When the scale reading is over 105 g, put the tension scale reading into 80 g once, and sets the scale  $100 + 5$  g.
- (3) Check that the indication of the DC voltmeter meets the required specification.

**Adjustment procedure:**

Adjust the RV504 to meet the required specification.



#### 8-6-4. Take-up Tension Detector 100 Gram Point Adjustment

Mode:STANDBY

##### Tool:

DC voltmeter (Digital multimeter)  
Locally-Specially-Made-Tape  
(referring sec. 8-6-3)  
Tension scale (100 g full scale)  
Extension board

##### Preparation:

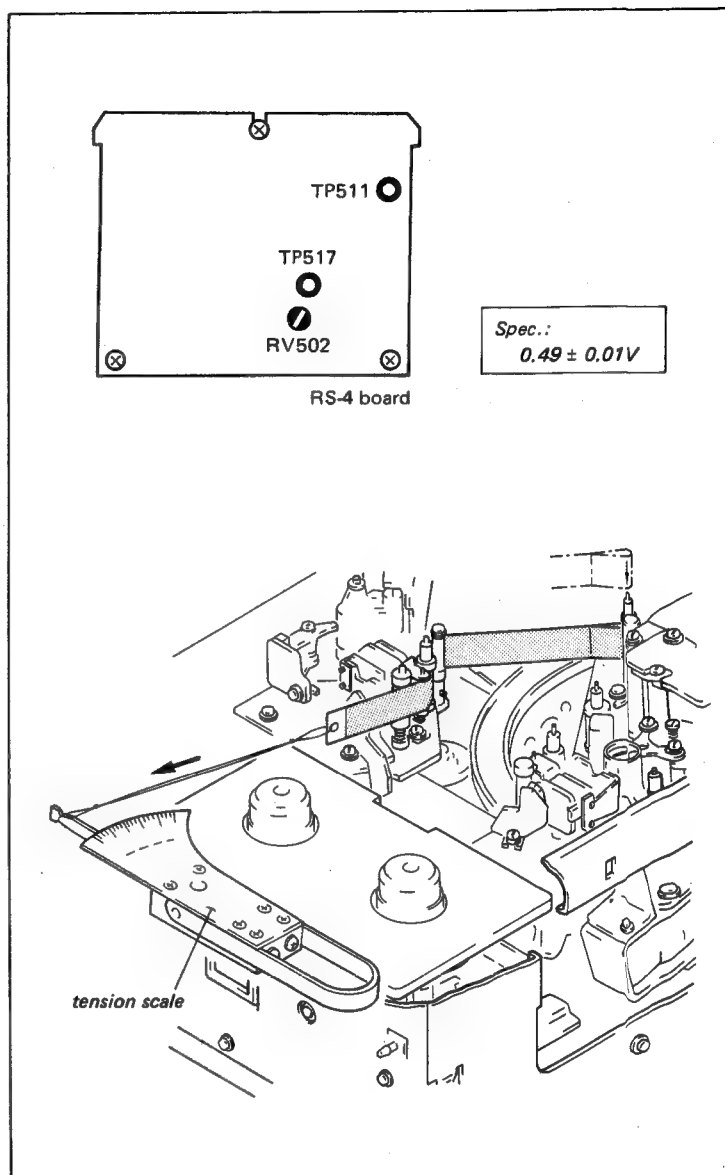
- (1) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter to TP517/RS-4 board.
- (2) Mute the tape beginning sensor and tape end sensor.
- (3) Mute the TAPE PROTECTION and the THREADING MOTOR DISABLE signals.
- (4) Put the machine into the STOP mode. Grasp the take-up and supply reel tables by hand and press the STANDBY button.

##### Check procedure:

- (1) Thread the special jig tape as shown in figure, and hook a tension scale on an end of the tape.
- (2) Move the tension scale slowly to as shown in figure direction and sets the scale  $100 \pm 5$  g. When the scale reading is over 105 g, put the tensin scale reading into 80 g once, and sets the scale  $100 \pm 5$  g.
- (3) Check that the indication of the DC voltmeter meets the required specification.

##### Adjustment procedure:

Adjust the RV502 to meet the required specification.



RACK TENSION AND TORQUE

## 8-7. TAKE-UP REEL MOTOR CURRENT SENSITIVE ADJUSTMENT

**Mode:**EJECT completion

**Tool:**

Extension board  
Reel table torque measurement tape  
(100 mm dia.)  
Tension scale (100 g full scale)  
DC voltmeter  
Constant current power supply

**Preparation:**

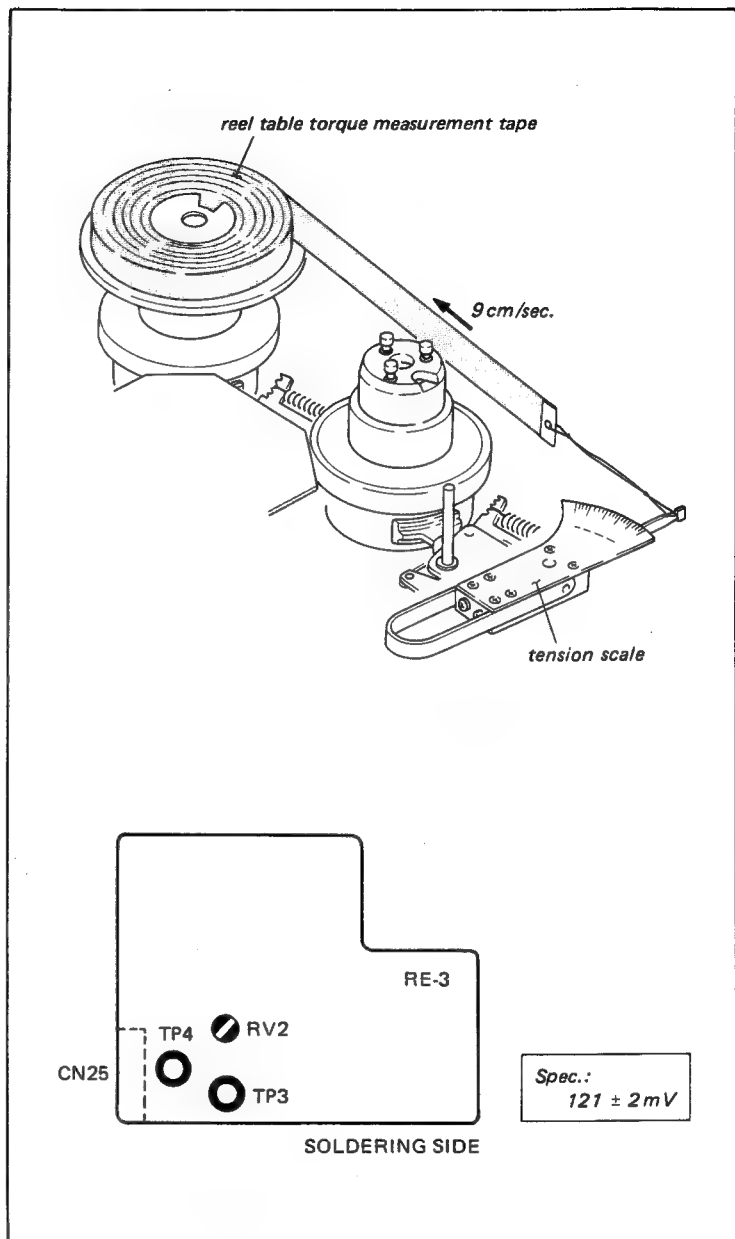
- (1) Remove the RS-3 board and insert the extension board. Do not insert the RS-3 board into the end of the extension board.
- (2) Disconnect the CN25 on the RE-3 board.
- (3) Turn on the power. Check that the take-up side reel brake is released.
- (4) Connect (-) terminal of the constant current power supply to TP3/RE-3 board, and (+) terminal to TP4/RE-3 board.
- (5) Connect (-) terminal of the DC voltmeter to A15/Extension board, and (+) terminal to A16/Extension board
- (6) Install the torque measurement tape on the take-up reel table.

**Check procedure:**

- (1) Turn the CURRENT control knob of the constant current power supply slightly, perform the procedure (2).
- (2) Hook a tension scale on an end of the tape as shown in figure and let the tape pulled at a constant speed of approx.9 cm/sec. and repeat the procedure (1) and (2) until the scale reading comes to  $96 \pm 4$  g. (If the measuring value fluctuates, take the average reading of the tension scale.)
- (3) When the scale reading is  $96 \pm 4$  g, check that the voltmeter reading meets the required specification.

**Adjustment procedure:**

Adjust the RV2/RE-3 board to meet the required specification.



## 8-8. SUPPLY REEL MOTOR CURRENT SENSITIVE ADJUSTMENT

Mode:EJECT completion

### Tool:

Extension board  
Reel table torque measurement tape  
(100 mm dia.)  
Tension scale (100 g full scale)  
DC voltmeter  
Constant current power supply

### Preparation:

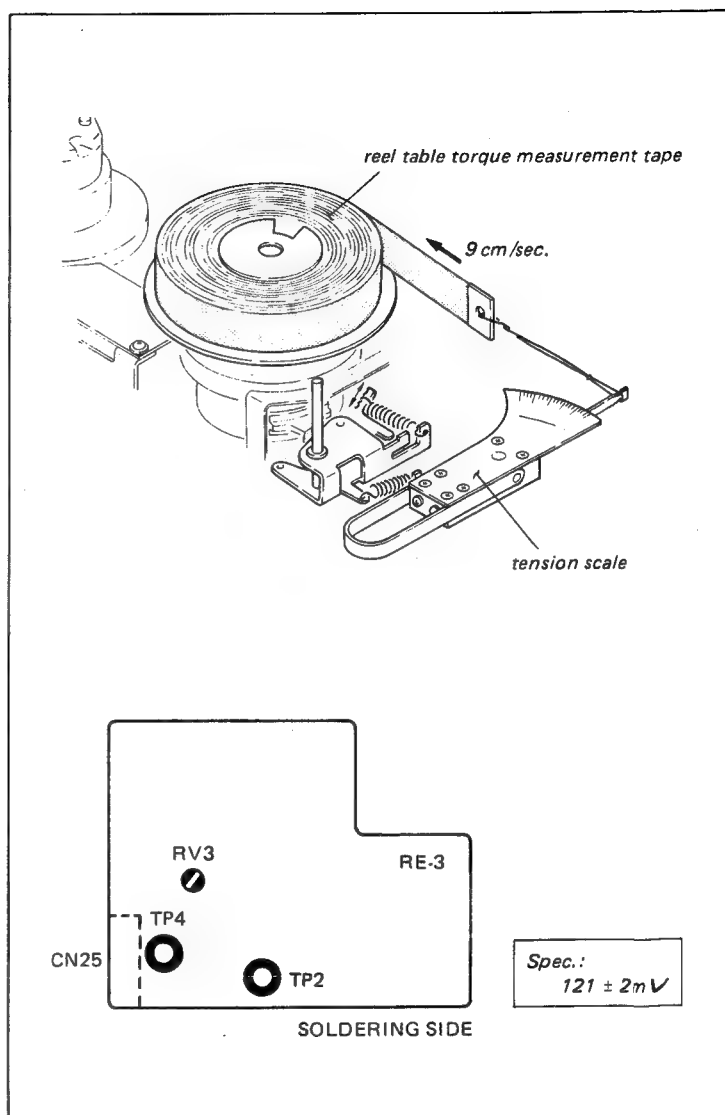
- (1) Remove the RS-3 board and insert the extension board. Do not insert the RS-3 board into the end of the extension board.
- (2) Disconnect the CN25 on the RE-3 board.
- (3) Release the supply side reel brake.
- (4) Turn on the power.
- (5) Connect (-) terminal of the constant current power supply to TP2/RE-3 board, and (+) terminal to TP4/RE-3 board.
- (6) Connect (-) terminal of the DC voltmeter to A17/Extension board, and (+) terminal to A18/Extension board
- (7) Install the torque measurement tape on the supply reel table.

### Check procedure:

- (1) Turn the CURRENT control knob of the constant current power supply slightly, perform the procedure (2).
- (2) Hook a tension scale on an end of the tape as shown in figure and let the tape pulled at a constant speed of approx.9 cm/sec. and repeat the procedures (1) and (2) until the scale reading comes to  $96 \pm 4$  g.  
(If the measuring value fluctuates, take the average reading of the tension scale.)
- (3) When the scale reading is  $96 \pm 4$  g, check that the voltmeter reading meets the required specification.

### Adjustment procedure:

Adjust the RV3/RE-3 board to meet the required specification.



## 8-9. DME FG OUTPUT CHECK

EM-1 Board Mounting Position Adjustment should be completed before initiating this adjustment.

### Tool:

Extension board

Oscilloscope

### Preparation:

- (1) Remove the RS-3 board and insert the extension board into this position. Insert the RS-3 board into the end of the extension board.
- (2) Turn the RV502 and RV504 on the RS-4 board in the clockwise direction as far as it will go. Do not turn these variable resistors except when the RS-4 board replacement is performed.
- (3) Mute the TAPE PROTECTION signal
- (4) Connect the oscilloscope to TP20, 21, 22 or 23 on the RS-3 board as following the check procedures and connect the ground to E 2.
- (5) Turn on the power.

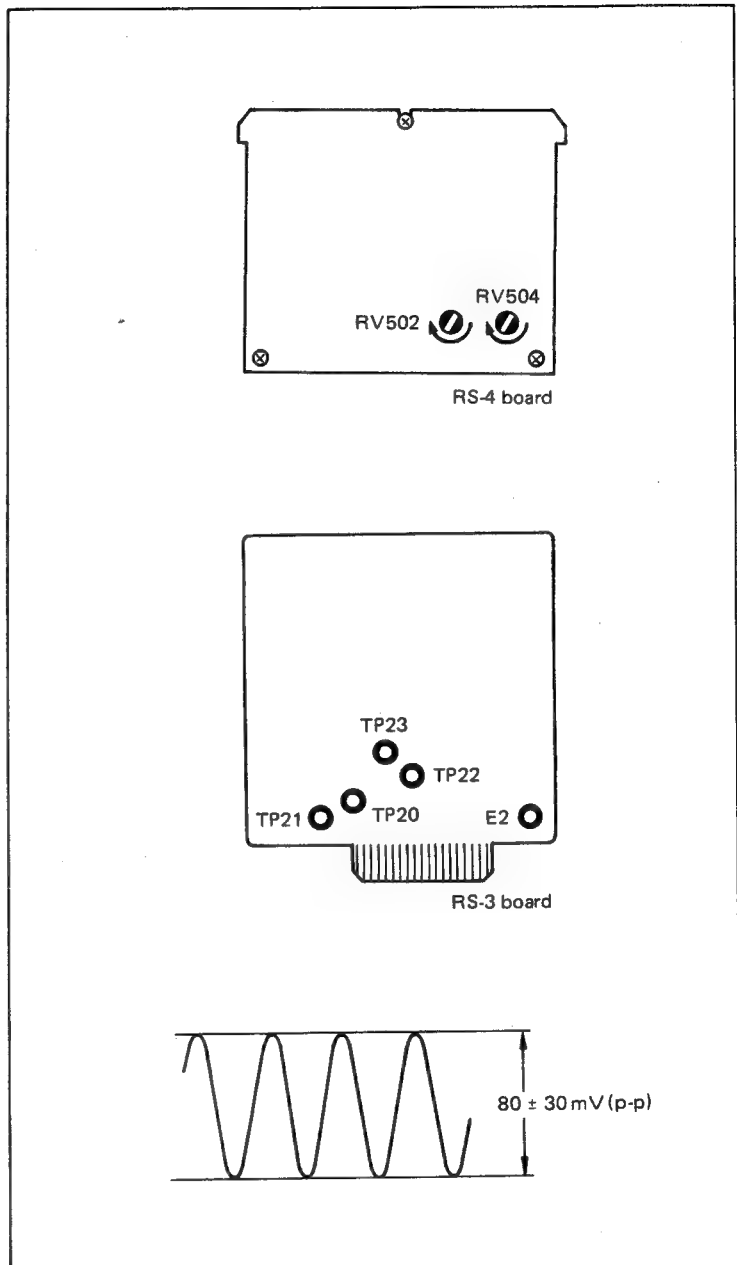
### Check procedure:

- (1) When the take-up reel table is turned to the counterclockwise direction by hand, check that the TP20 and 21 outputs meet the required specification.
- (2) When the supply reel table is turned to the counterclockwise direction by hand, check that the TP22 and 23 outputs meet the required specification.

### Adjustment procedure:

If it is not, replace DME and check again.

After this adjustment, perform the sec. 8-6-3 Supply Tension Detector 100 Gram Point Adjustment and sec. 8-6-4 Take-up Tension Detector 100 Gram Point Adjustment.





## SECTION 9

### TAPE RUN ALIGNMENT

#### 9-1. PINCH ROLLER ADJUSTMENT

##### 9-1-1. Pinch Lever Right Angle Adjustment

This adjustment is precisely factory-calibrated before shipment so that no adjustment is required except the pinch lever and the capstan shaft replacements.

**Tool:** Pinch lever adjustment jig

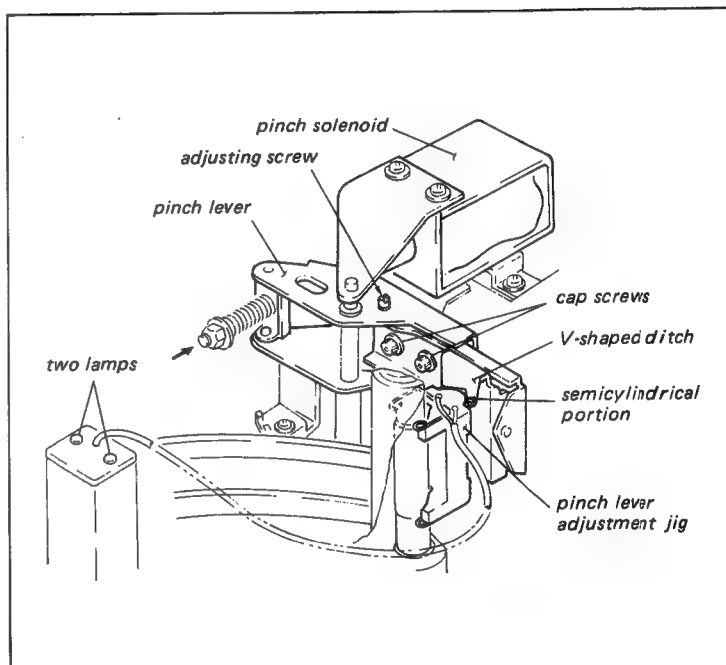
**Mode:** EJECT Completion

##### Check procedure:

- (1) Install the pinch lever adjustment jig taking care not to give scar on the capstan.
- (2) Push the pinch lever until V-shaped ditch of the pinch lever contacts the semicylindrical portion of the jig lightly. Check that the two lamps of the jig light at the same time.

##### Adjustment procedure:

- (1) Loosen the two cap screws of the pinch lever and adjust the adjusting screw.
- (2) After this adjustment, tighten the cap screws and check again.



### 9-1-2. Pinch Roller Stopper Position adjustment

If the clearance is narrower than the specification, the possible trouble is that the pinch roller pressure against the capstan shaft may be so low that the tape will not be advanced at the proper speed.

If, in opposite, the clearance is too much, it is possible that the iron core is not engaged.

**Tool:** Thickness gauge

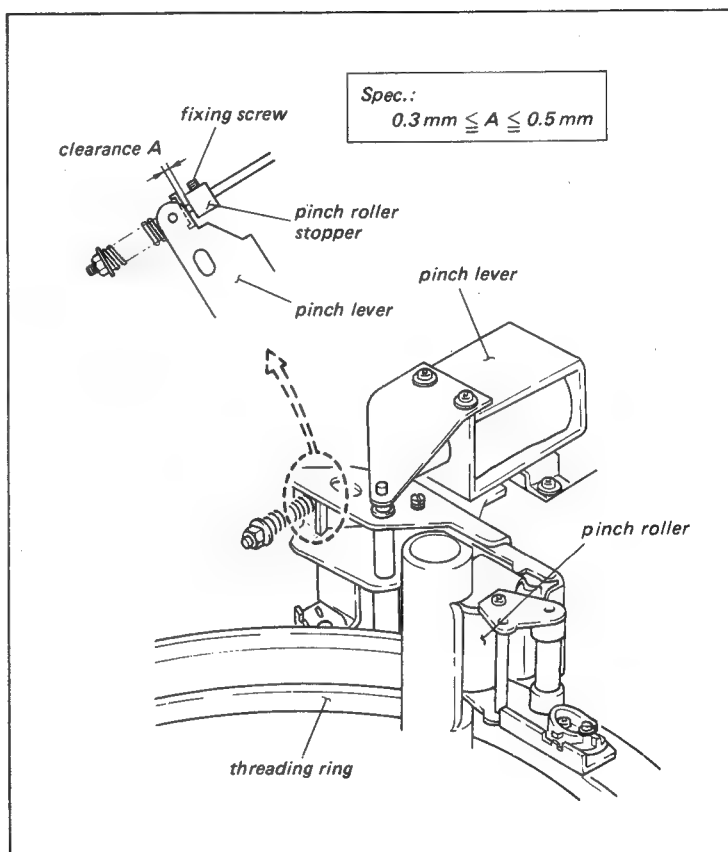
**Mode:** PLAY

#### Check procedure:

- (1) Check that the clearance between the pinch roller stopper and the pinch lever meets the required specification using a thickness gauge.
- (2) Repeat pressing the PLAY and STOP buttons two or three times and check that the clearance.

#### Adjustment procedure:

Adjust the position of the pinch roller stopper.



### 9-1-3. Pinch Roller Self-Alignment Adjustment

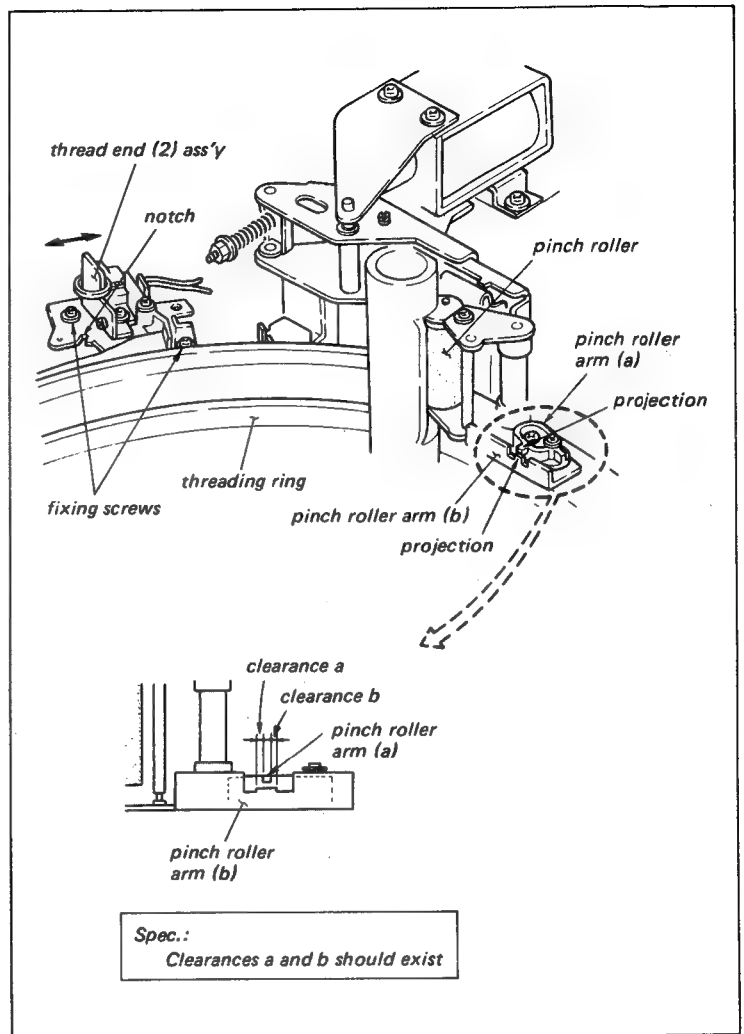
Mode:PLAY

#### Check procedure:

Check that the positional relationship between the pinch roller arm (a) and the pinch roller arm (b) meets the required specification.

#### Adjustment procedure:

- (1) Loosen the fixing screw 1/4 turns of the thread end (2) ass'y.
- (2) Insert a flatblade 3mm screwdriver into the notch, and move the thread end (2) ass'y in the direction shown by arrow to meet the required specification.
- (3) Repeat the PLAY and EJECT modes two or three times, and check the positional relationship meets the required specification.



#### 9-1-4. Pinch Roller Zenith Adjustment

**Mode:**STOP

**Check procedure:**

Push the pinch lever A portion in the direction of the arrow lightly so that the pinch roller contacts the capstan shaft. Check that the positional relationship between the pinch roller and the capstan shaft meets the required specification.

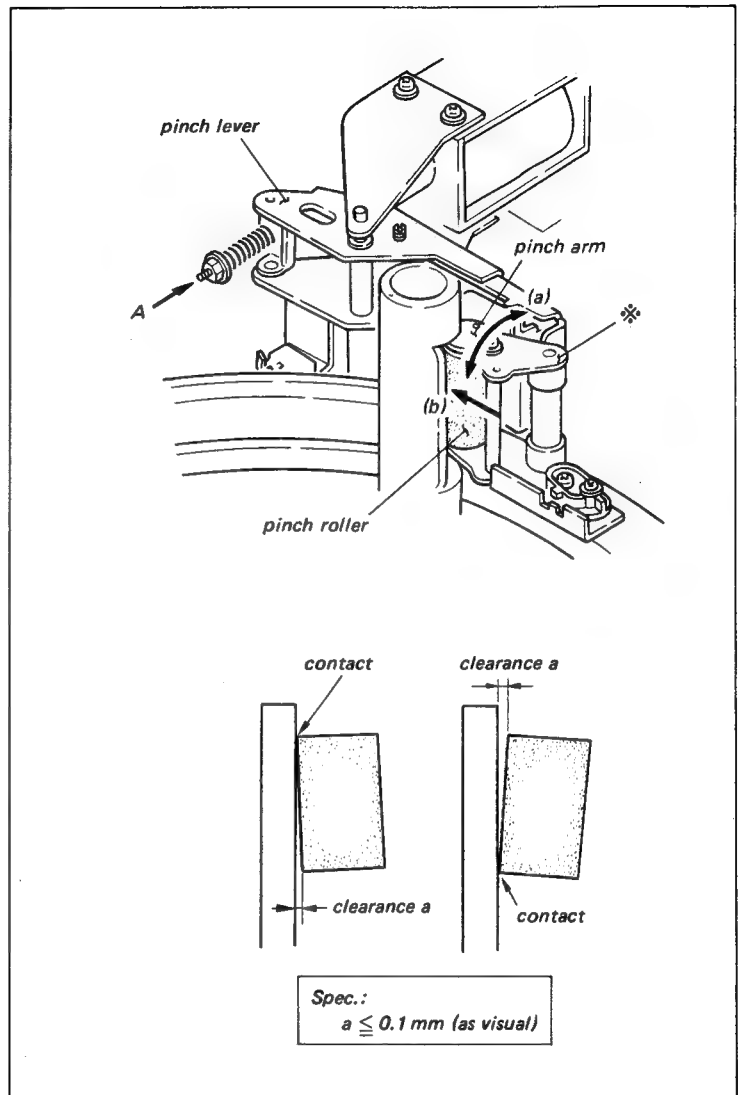
**Adjustment procedure:**

If the clearance is out of spec. at the bottom portion when the top portion is in contact with the capstan shaft.

- (1) Hold the \* marked portion of the pinch arm and bend it in the direction of the arrow (a).

If the clearance is out of spec. at the top portion when the bottom portion is in contact with the capstan shaft.

- (2) Hold the \* marked portion of the pinch arm and bend it in the direction of the arrow (b).



#### 9-1-5. Pinch Roller Azimuth Adjustment

If this adjustment is poor, possible trouble is that a curl of tape at top and bottom flanges of tape guides (3) and (4), threading guides (1), (2) and (3), is resulted during the period of tape threading and tape will get scar.

**Mode:**PLAY

**Tool:**

Inspection mirror(handle)  
Inspection mirror(mirror)  
Circuit tester  
Sony grease

**Check procedure:**

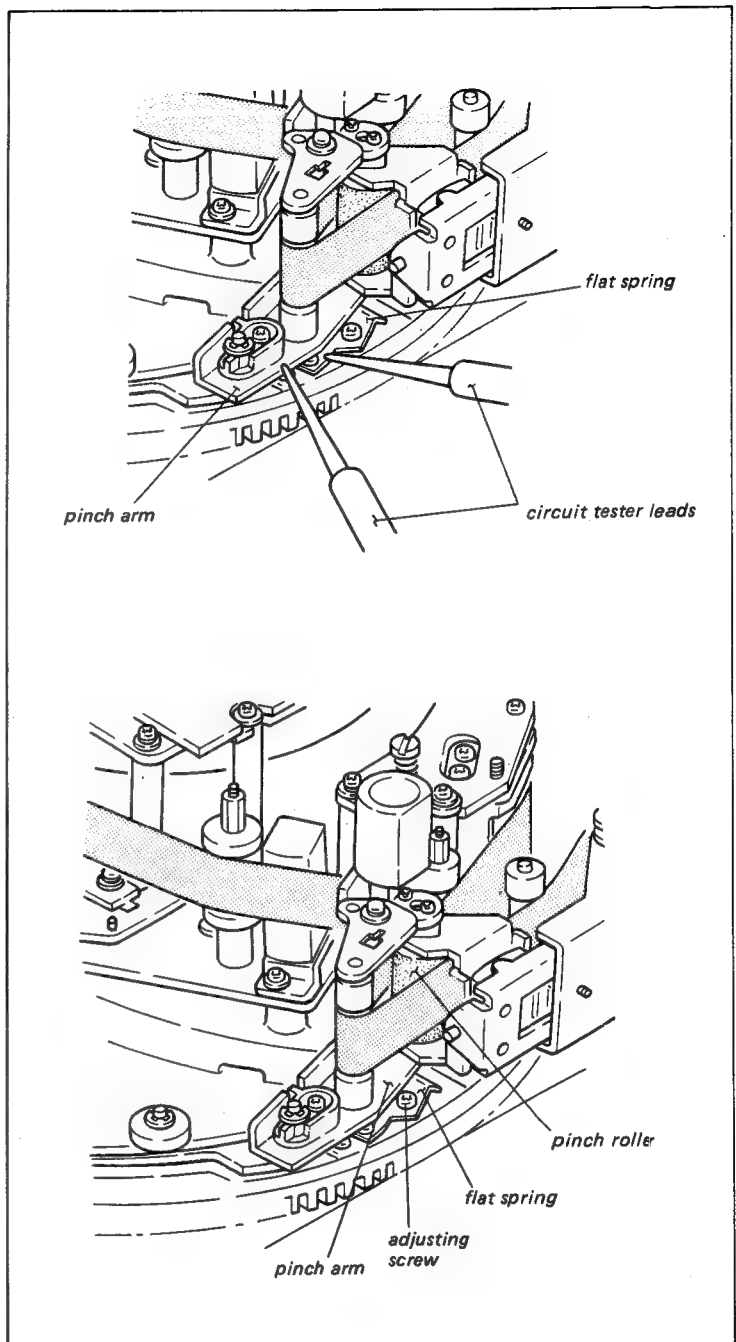
- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment) and put the machine into the threading mode.
- (2) Observe the tape run during the threading at the TG-3, TC-4, threading guides (1), (2) and (3). Check that there exists no tape curl at top and bottom flanges of the tape guides.
- (3) Check to repeat the threading operation two or three times.

**Adjustment procedure:**

- (1) Turn the adjusting screw to the clockwise direction and put not to contact flat spring to the pinch arm.
- (2) Contact the circuit tester leads to flat spring and pinch arm as shown in figure. Turn the adjusting screw to the counterclockwise direction slowly until the flat spring contacts the pinch arm.
- (3) Check the tape curl as check procedure. Fine-adjust the adjusting screw so that the curl does not exist.
- (4) Put the machine into EJECT completion mode. Push the pinch arm toward the drum ass'y lightly with a finger, and smear sony grease a little onto the projection of the flat spring.

**(CAUTION)**

Take care not to smear sony grease onto the pinch roller and the guides.



## 9-1-6. Pinch Roller Preset Adjustment

**Mode:** STOP

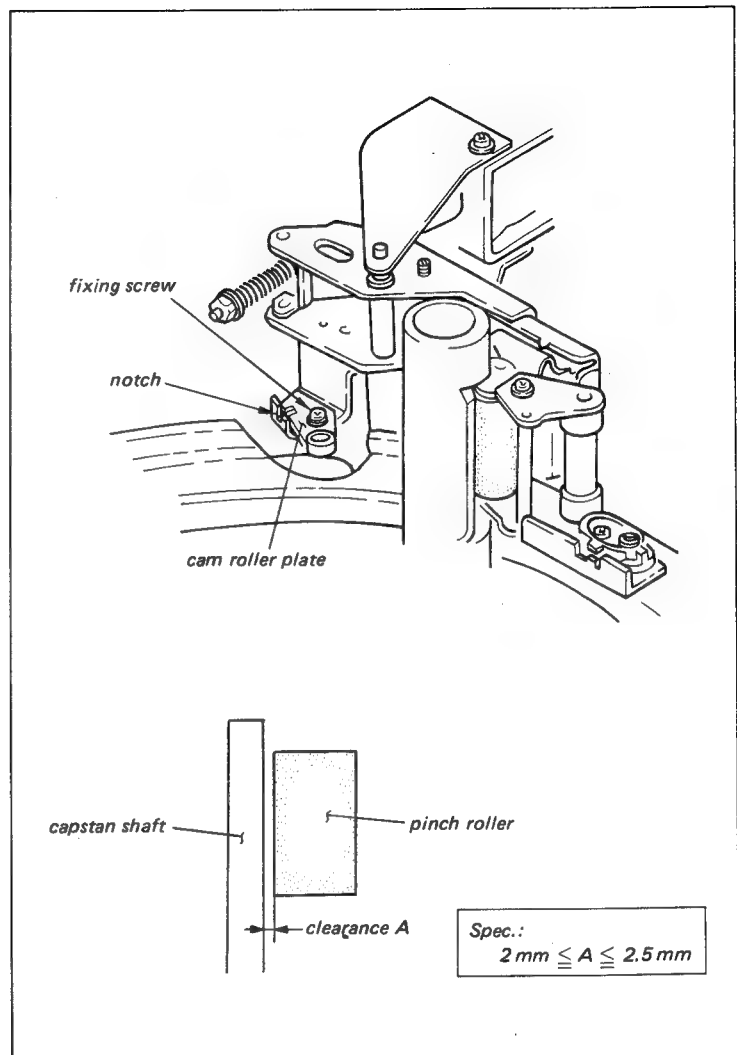
**Tool:** Thickness gauge

### **Check procedure:**

Check that the clearance between the capstan shaft and the pinch roller meets the required specification.

### **Adjustment procedure:**

- (1) Loosen the fixing screw of the cam roller plate about 1/4 turns.
- (2) Insert a flatbrade 3 mm screwdriver into the notch of the cam roller plate, and adjust the position meets the required specification
- (3) Repeat the EJECT and STOP modes two or three times and check clearance.



## 9-2. FWD/REV TAPE RUN ADJUSTMENT

### 9-2-1. Tape Run Adjustment at Threading Guide (1)

Mode:PLAY/STOP

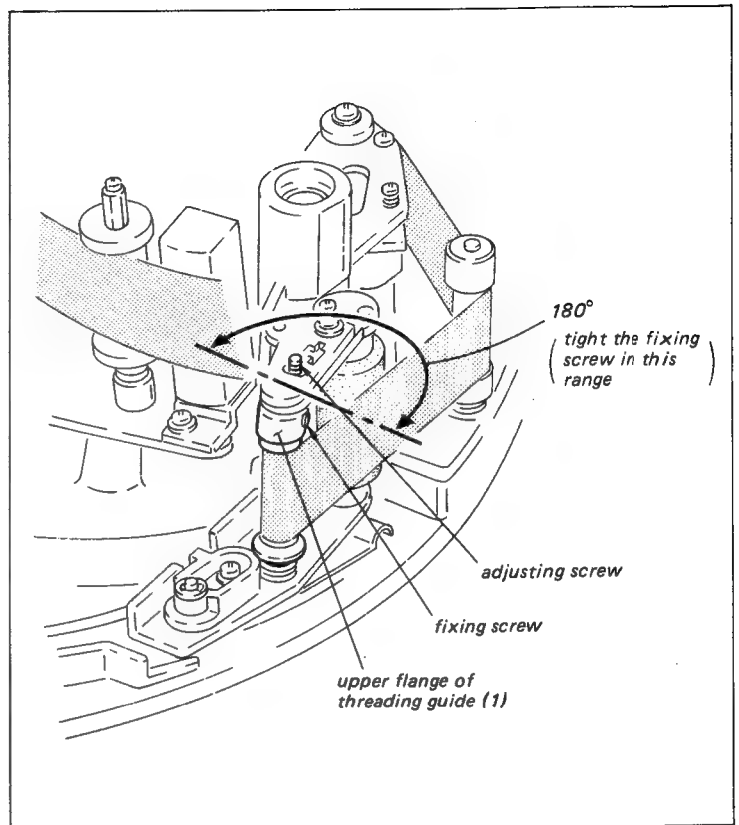
Tool:Allen wrench (each edge has 0.9mm/1.27mm)

#### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment). Put the machine into the FWD mode(xl). Check that the tape top edge runs in contact with the upper flange of the threading guide (1) without curl.
- (2) Put the machine into the STOP mode. Check that the tape top edge contacts the upper flange of the threading guide (1) without curl.

#### Adjustment procedure:

- (1) Loosen the fixing screw of the flange and adjust to meet the required specification with adjusting screw in the PLAY mode.
- (2) Tighten the fixing screw of upper flange within the range as shown in figure.



## 9-2-2. Tape Wrinkle Release Adjustment at Pinch Roller

**Mode:**FWD(x1/30) to FWD(x5)  
REV(x1/30) to REV(x5)

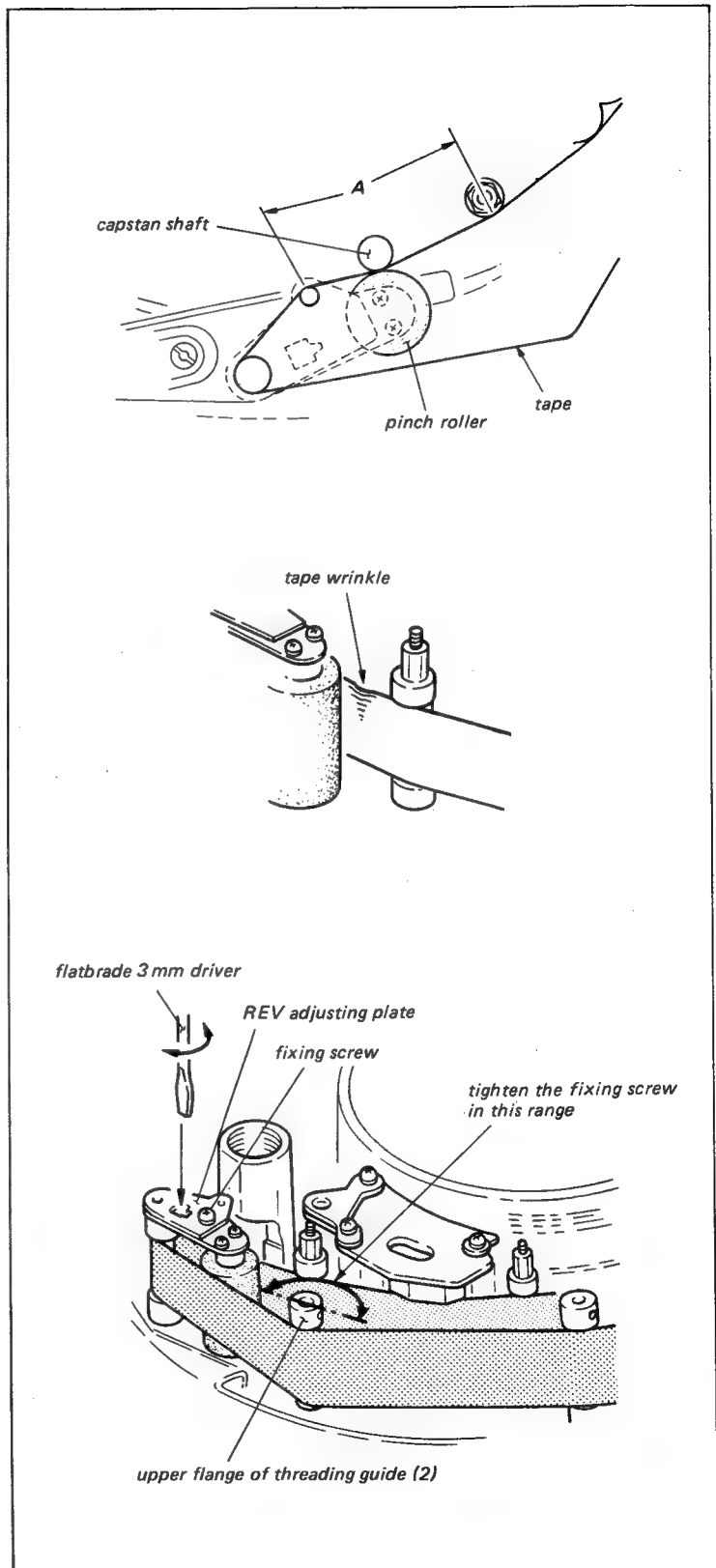
**Tool:**Allen wrench (each edge has 1.27mm)

### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment). Put the machine into the REV mode(x1). Observe the surface of the running tape very carefully in the A section as shown in figure. Check that amount of tape tension at the two points is exactly equal i.e., equal at the tape top and tape bottom. The tape wrinkle should be as shown in figure.
- (2) Repeat the FWD(x1/30) to (x5) and the REV(x1/30) to (x5) operation. Observe the surface of the running tape very carefully in the A section as shown in figure. Check that amount of tape tension is exactly equal.
- (3) Put the KCA-60 cassette tape at the tape beginning portion. Put the machine into the FWD(x1) and REV(x1) mode. Check that the tape wrinkle, that is given in the moment of the pinch roller's pressing against the capstan, does disappear within 1.5 second.
- (4) Put the machine into the FWD(x5) and REV(x5) modes. If a scar does not mark, though tape wrinkles does disappear in a moment, it is acceptable.
- (5) Put the tape at the tape end portion. Check that the tape wrinkle as the same manner in steps (3) and (4).

### Adjustment procedure:

- (1) Fine-adjust the position of upper flange of threading guide (2) to satisfies the specification.





**(CAUTION)**

Tighten the fixing screw of upper flange within the range as shown in figure.

- (2) If the tape tension at the two points does not turn into the exactly equal by step (1), loosen the fixing screw 1/2 to 1/4 turns of REV adjusting plate and insert a flatbrade 3mm screwdriver into the hole, and turn the screwdriver in the direction shown by arrow until the tape tension at the two points is exactly equal.

**9-2-3. Tape Run Adjustment at Correction Guide (A)**

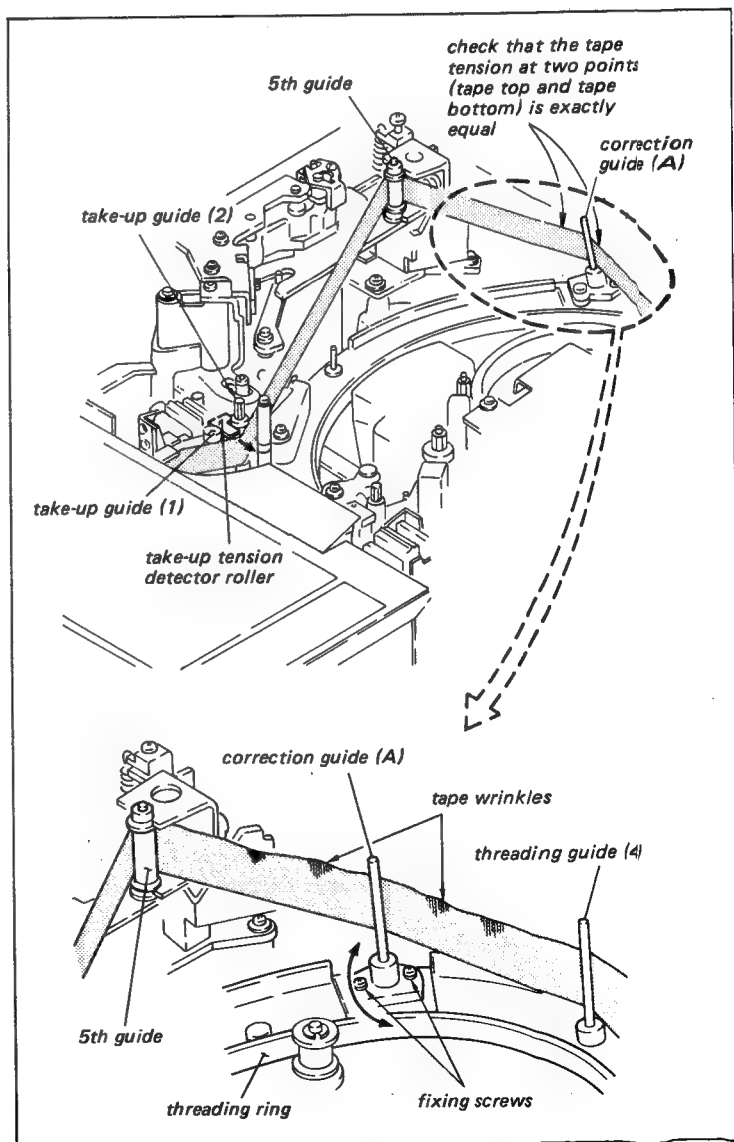
Mode:FWD(X1), REV(x1)

**Check procedure:**

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment) and put the machine into the FWD mode(x1).
- (2) Observe the surface of the running tape very carefully in the position as shown in figure. Check that amount of tape tension at the two points is exactly equal i.e., equal at the tape top and tape bottom.
- (3) Put the machine into the REV mode(x1). Check that the tape tension as the same manner in step (2).
- (4) Put the machine into the FWD mode(x1). Press the T-tension detector roller lightly in the direction of the arrow with finger. Check that the tape runs without curl at the top and bottom flanges of 5th guide.

**Adjustment procedure:**

Loosen the fixing screw of correction guide (A) 1/2 turns and move the guide in the direction of the arrow to meet the required specification in all modes.



#### 9-2-4. Tape Run Adjustment at 6th Guide

Mode:FWD(x1), REV(x1)

##### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment). Put the machine into the FWD mode(x1).
- (2) Check that the tape runs without curl at the top and bottom flanges of the 6th guide, take-up guide (1) and (2).
- (3) Check the tape run same as the above in the REV(x1) mode.
- (4) Put the machine into the FWD (x1) mode. Push the T tension detector roller lightly in the direction of the arrow with finger. Check that the tape running without curl at the top and bottom flanges of take-up guide (1) and (2).

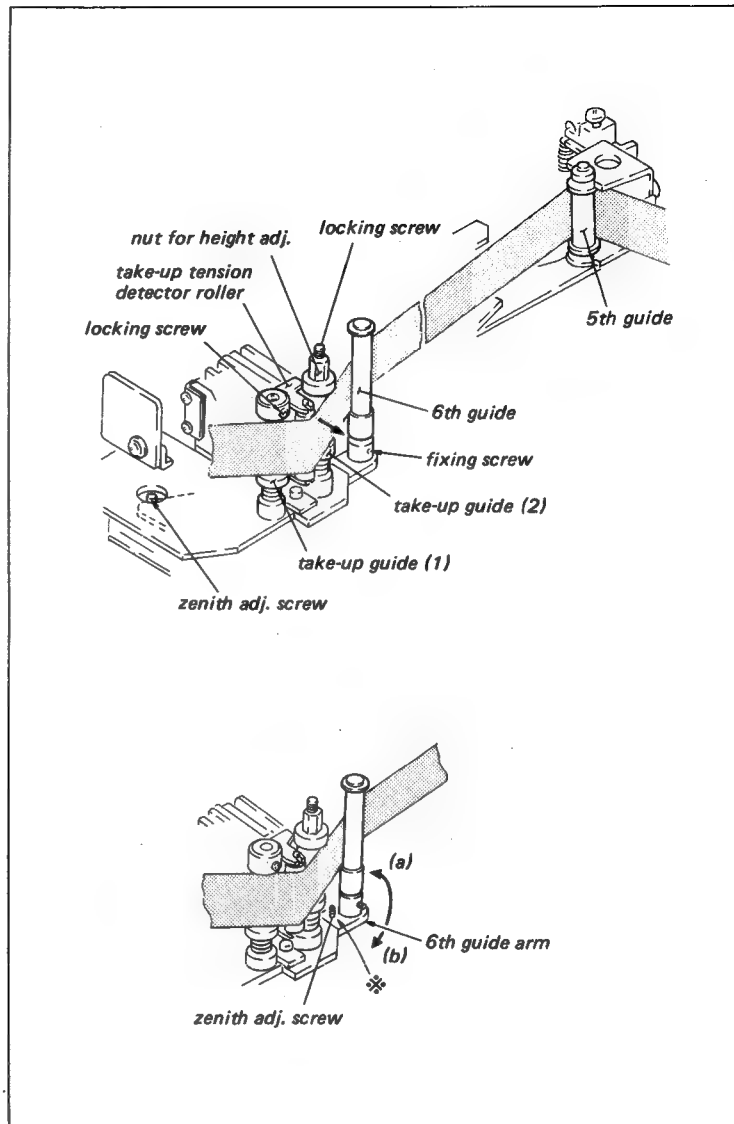
##### Adjustment procedure:

If there exists tape curl in the procedures (2) and (3).

- (1) If there exists tape curl at the 6th guide, loosen the fixing screw and adjust the height.  
If there exists tape curl at the take-up guide (1) and (2), loosen the locking screw of take-up guide (2). Turn the adjusting nut and adjust the height.

If there exists tape curl in the procedure (4).

- (2) If there exists tape curl at the top and bottom flanges of take-up guides (1) and (2), turn the 6th guide zenith adj. screw in the clockwise direction.  
If there exists tape curl at the bottom flange, tune the adj. screw in the counter-clockwise direction.



Do not rotate the zenith adj. screw more than one full turn (360 degrees) in either direction of the clockwise or counterclockwise.

- (3) If the adjusting is not satisfied in step (2), adjust as follows.  
Turn the zenith adj. screw of 6th guide.

#### 9-2-5. Tape Run Adjustment at S Guide (1) and (2)

##### Tool:

Alignment tape, RR5-4SB  
Oscilloscope  
Extension board

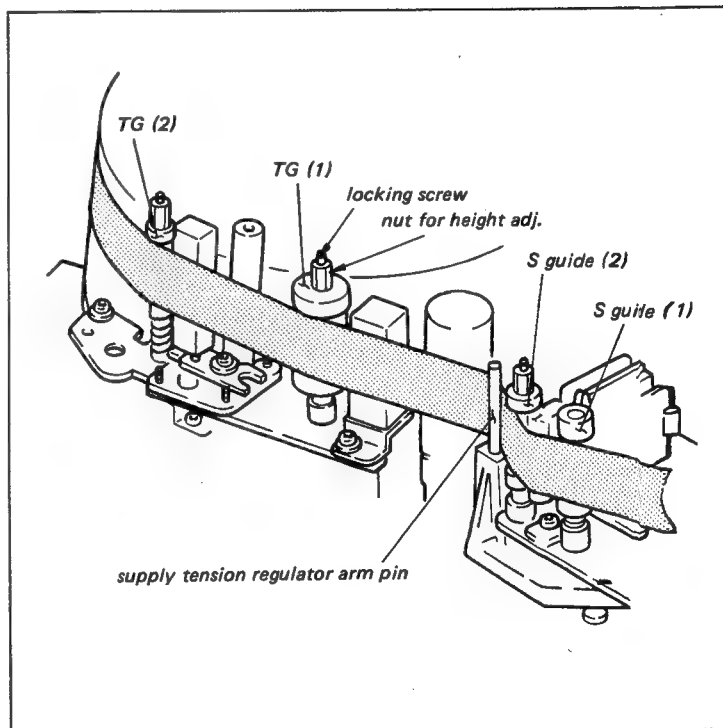
Mode:FWD(x1), REV(x1)

##### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment) and put the machine into the FWD(x1) mode.
- (2) Check that there are not curl at tape guides (1), (2), TG1 and TG2.
- (3) Check that amount of tape tension at the two points is exactly equal i.e., equal at the tape top and tape bottom at the supply tension regulator.

##### Adjustment procedure:

- (1) Connect the oscilloscope to TP6/YD-10 board and externally trigger from TP3/YD-10 board.
- (2) Play back the color-bar portion or the monoscope portion of the alignment tape.



TAPE RUN

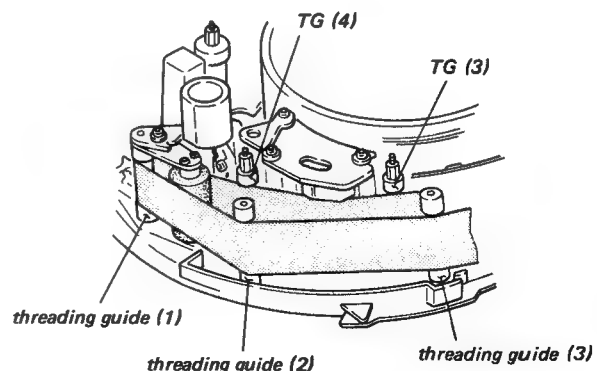
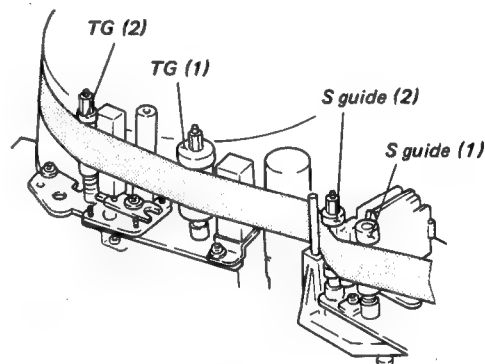
- (3) Adjust height of the guides so that the RF envelope fluctuation maintains flatness and the tape run without curl of supply guide (1), (2), TG1 and TG2. Adjust height so that amount of tape tension at the supply tension regulator is exactly equal i.e., equal at the tape top and tape bottom. Do not adjust the slantness of supply tension regulator arm pin.

#### 9-2-6. FWD/REV Tape Run Overall Adjustment

Mode:FWD(x1), REV(x1)

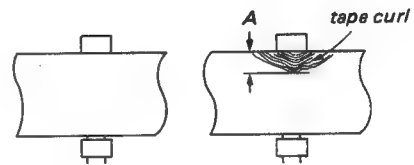
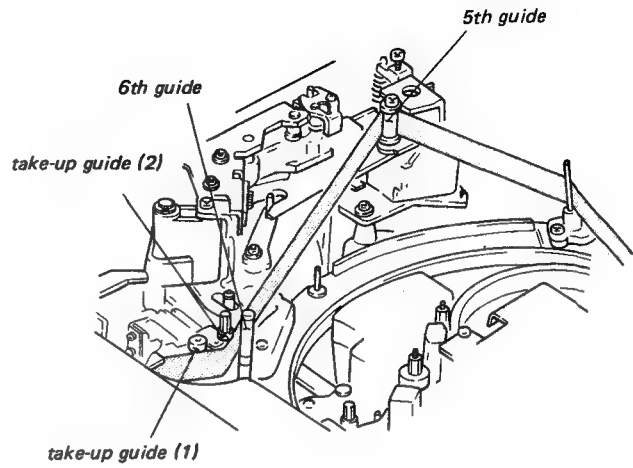
##### Check procedure:

- (1) Insert a KCA-60 cassette tape. Repeat putting the machine into the FWD (x1) and the REV-(x1) modes. Check as follows.
- (2) Check that there is not curl of supply guide (1), (2), TG1 and TG2. Tape curl, if it exists in the FWD(x1) or the REV(x1) modes, check that the tape curl meets the specification. Observe the surface of the running tape very carefully in the supply tension regulator. Check that amount of tape tension at the tape top and tape bottom is exactly equal amount.
- (3) Check that there exists no tape curl of TG3, TG4 and threading guide (2). Tape curl, if it exists in the FWD(x1) or the REV(x1) modes, check that curl meets the specification. Check that there exists no tape curl at threading guide (1).
- (4) Check that there exists no tape curl at 5th guide. Tape curl, if it exists in the FWD(x1) or the REV(x1) mode, check that curl meets the required specification. Check that there exists no tape curl at take-up guide (1), (2) and 6th guide.



**Adjustment procedure:**

If tape curl does not meet the required specification, perform the sec.9-2 FWD/REV Tape Run Adjustment.



**Spec.:**

There exists no tape curl in REV and FWD modes.  
If there exists tape curl, the tape curl in either  
FWD or REV mode is acceptable.

Acceptable tape curl is  $A \leq \frac{\text{tape width}}{4}$

### 9-2-7. S Tension Regulator Arm Pin Slantness Adjustment

This adjustment is usually not required. Proceed the following steps only when the supply tension regulator arm block is replaced or removed.

**Tool:** Flatness plate

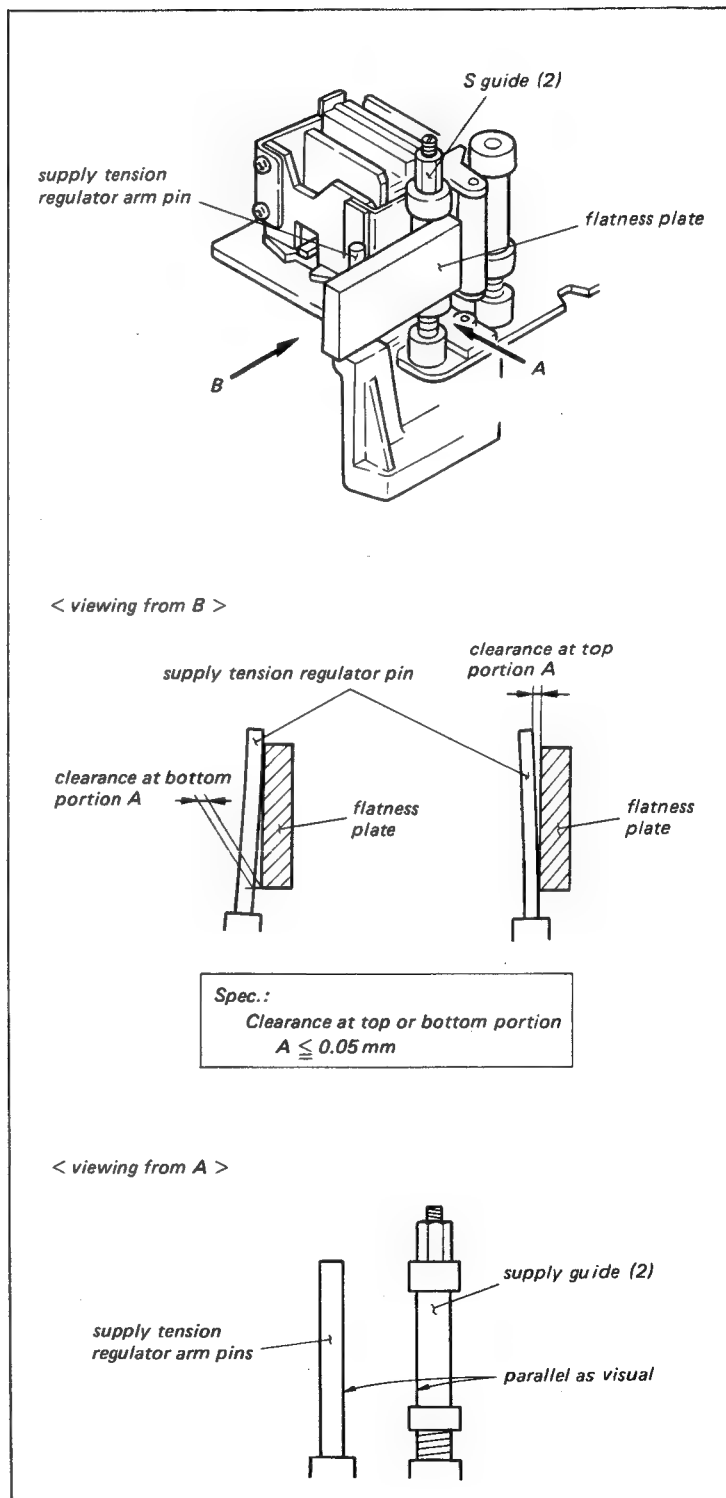
**Mode:** STANDBY

#### Check procedure:

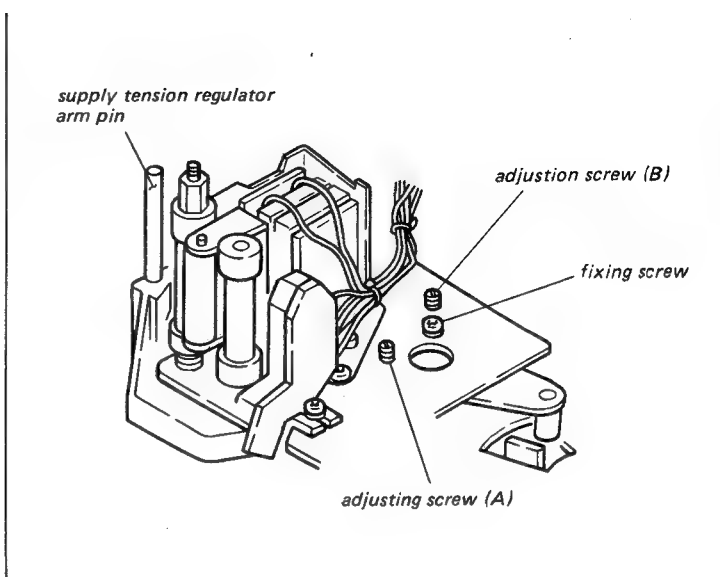
- (1) Set the flatness plate on the supply guide (2) as shown in figure. Press the flatness plate with the S tension regulator pin lightly. Check that the clearance between S tension regulator pin and flatness plate meets the required specification.
- (2) Check that the clearances of the top and bottom between the S tension regulator pin and the supply guide (2) are equal viewing from the direction of the arrow A.

#### Adjustment procedure:

- (1) If the check procedure (1) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw about 1/2 turns and turn the adjusting screw A and B of exactly equal amount in clockwise direction. Tighten the fixing screw and check again.  
When the clearance is out of spec. at the bottom portion, turn the adjusting screws A and B of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check again.
- (2) If the check procedure (2) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw about 1/2 turns and turn the adjusting screw A and B of exactly equal amount in clockwise direction. Tighten the fixing screw and check again.



When the clearance is out of spec. at the bottom portion, turn the adjusting screws A and B of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check again.



### 9-3. VIDEO TRACKING ADJUSTMENT

#### Tool:

Alignment tape, RR5-4SB  
Flatness plate  
Extension board  
Oscilloscope

#### Preparation:

- (1) Turn off the power.
- (2) Remove the YD-10 board from the Amp chassis and insert the extension board into this position.
- (3) Insert the YD-10 board into the end of the extension board.
- (4) Connect the oscilloscope to TP6/YD-10 board, and externally trigger from TP3/YD-10 board.
- (5) Turn on the power.
- (6) Playback the color-bar or monoscope portion of the alignment tape.
- (7) Set the DT SELECT switch to the OFF position.

#### Check procedure:

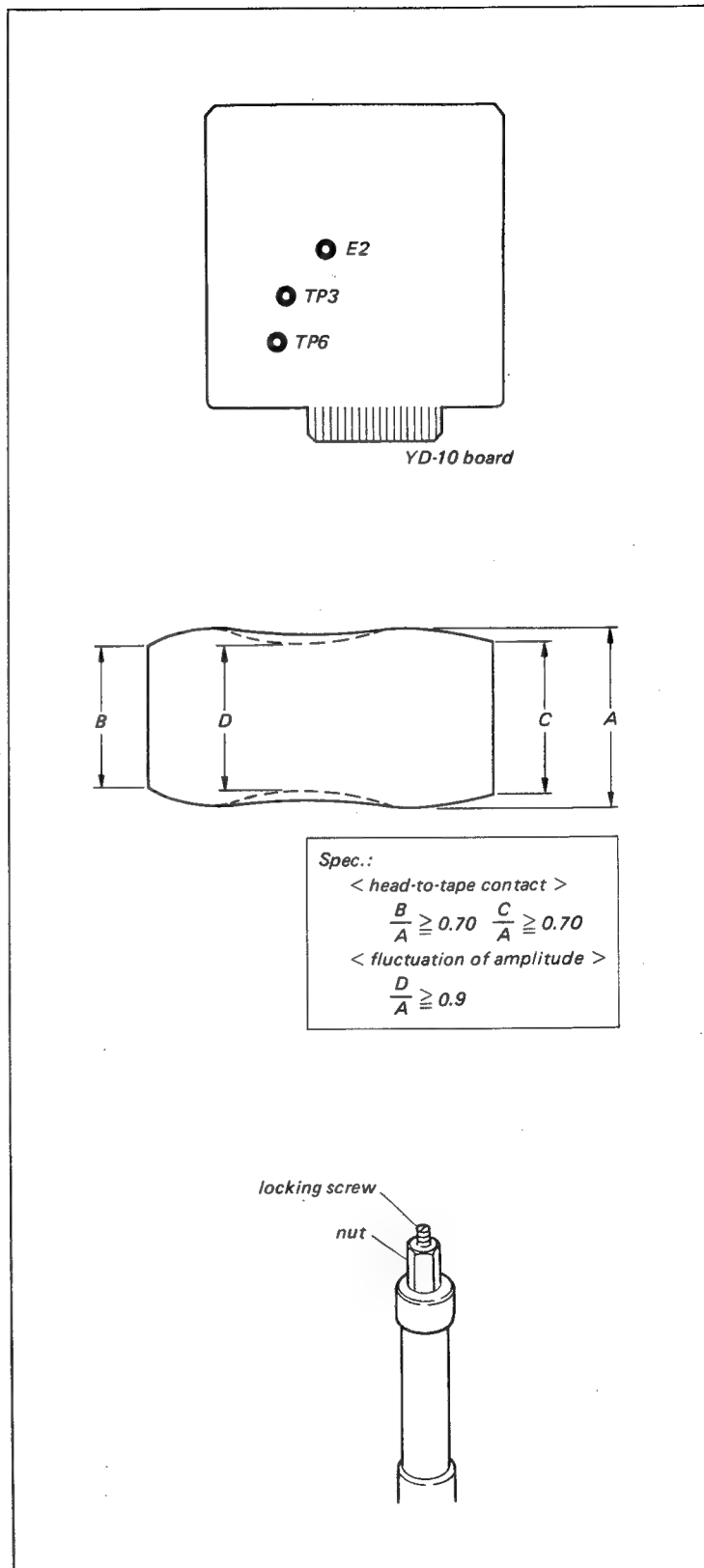
- (1) While observing the waveform on the scope, turn the TRACKING control knob in the both directions noting that the RF waveform maintains a flat envelope while the amplitude increases and decreases.
- (2) Confirm that the RF waveform fluctuation and head-to-tape contact are within the specification when the RF envelope is made as large as possible by turning the TRACKING control knob.

#### Adjustment procedure:

When perform the tape guide height adjustment, loosen the locking screw of tape guides.

When the tracking at the drum's input side is no good.

- (1) Set the TRACKING control knob so that the RF waveform amplitude is made to 70 to 80 % of the maximum amplitude.



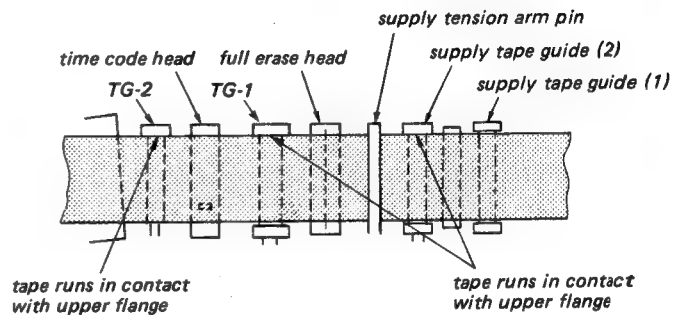
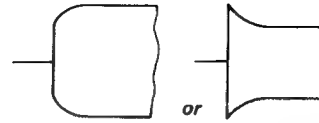


- (2) Adjust height of the tape guides of TG-1, TG-2 and supply tape guide 2. Do not adjust the slantness of the supply tension regulator arm.

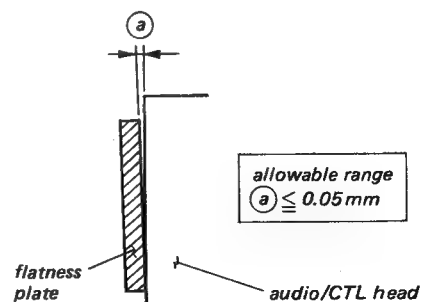
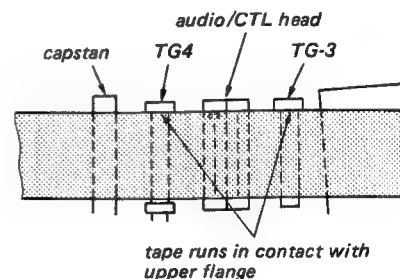
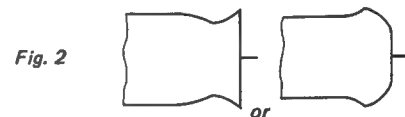
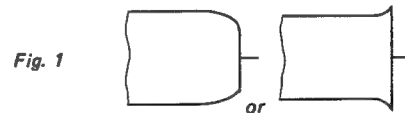
When the tracking at the drum's exit side is no good.

- (3) Set the TRACKING control knob so that the RF waveform amplitude is made to 70 to 80 % of the maximum amplitude.
- (4) When the RF waveform is not flat as shown in Fig.1, adjust the height of TG-3 and TG-4 so that the RF waveform is flat. When the RF waveform is no flat as shown in Fig.2, adjust the height of TG-3 and TG-4 so that the RF waveform is flat. If it does not with this adjustment, adjust the zenith of the audio/CTL head within the allowable range. Adjust the height of the TG-3 and TG-4.

< drum entrance side >



< drum exit side >



#### 9-4. ERASE HEAD ZENITH ADJUSTMENT

**Tool:** Flatness plate

##### **Check procedure:**

Check that the clearance between the erase head and the flatness plate meets the required specification, when the flatness plate is set on the erase head and TGI.

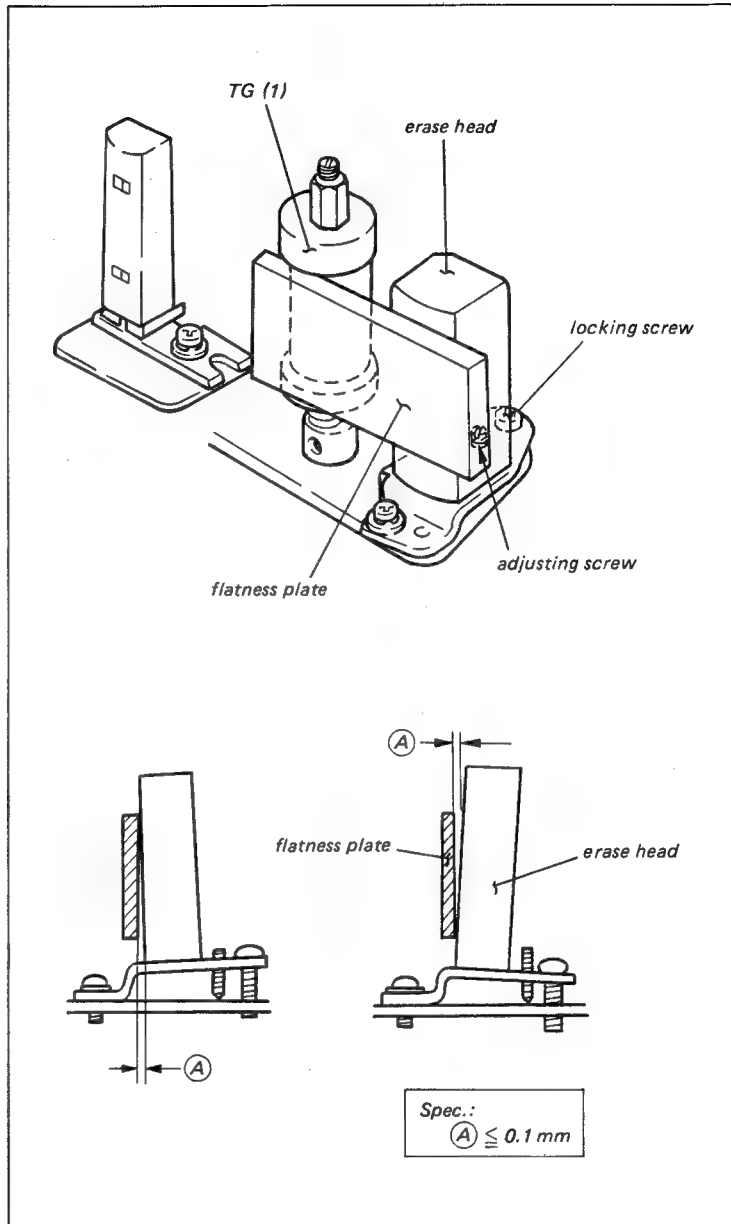
##### **Adjustment procedure:**

When the clearance is out of spec. at the top portion of the erase head.

- (1) Turn the adjusting screw in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.

When the clearance is out of spec. at the bottom portion of the erase head.

- (3) Loosen the locking screw.
- (4) Turn the adjusting screw in clockwise direction.
- (5) Tighten the locking screw and check zenith again.



## 9-5. TIME CODE HEAD ADJUSTMENT

### 9-5-1. Time Code Head Tape-to-Head Contact Adjustment

#### Tool:

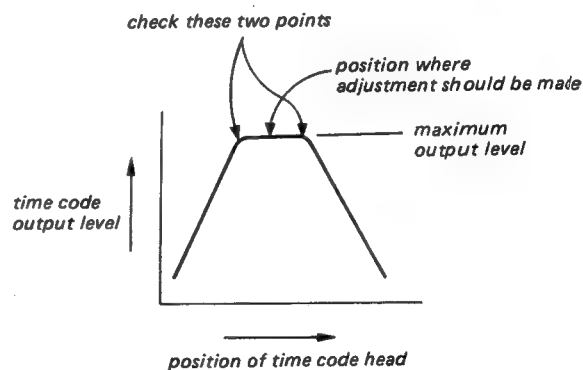
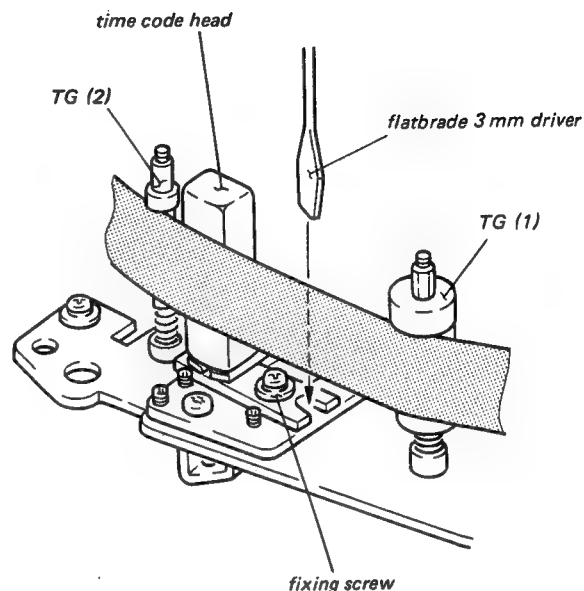
Alignment tape, RR5-4SB  
VTVM or oscilloscope

#### Preparation:

- (1) Connect the VTVM or oscilloscope to TIME CODE OUT terminal.
- (2) Playback the color-bar portion of the alignment tape. (time code output level is about -30 dB.)

#### Adjustment procedure:

- (1) Loosen the fixing screw of time code head about 1/4 turns.
- (2) Insert a flatbrade 3mm screwdriver into the hole as shown in figure. Adjust the time code head block where the output is maximum and starting to decrease.
- (3) Set the time code head block on the middle portion of two points and tighten the fixing screw.



## 9-5-2 Time Code Head Height Adjustment

### Tool:

Alignment tape, RR5-4SB

VTVM or Oscilloscope

### Preparation:

- (1) Connect the VTVM or oscilloscope to TIME CODE OUT terminal.
- (2) Playback the color-bar portion of the alignment tape.

### Check procedure:

Check that the level increase is less than 0.5 dB when pressing down at A and pushing up B.

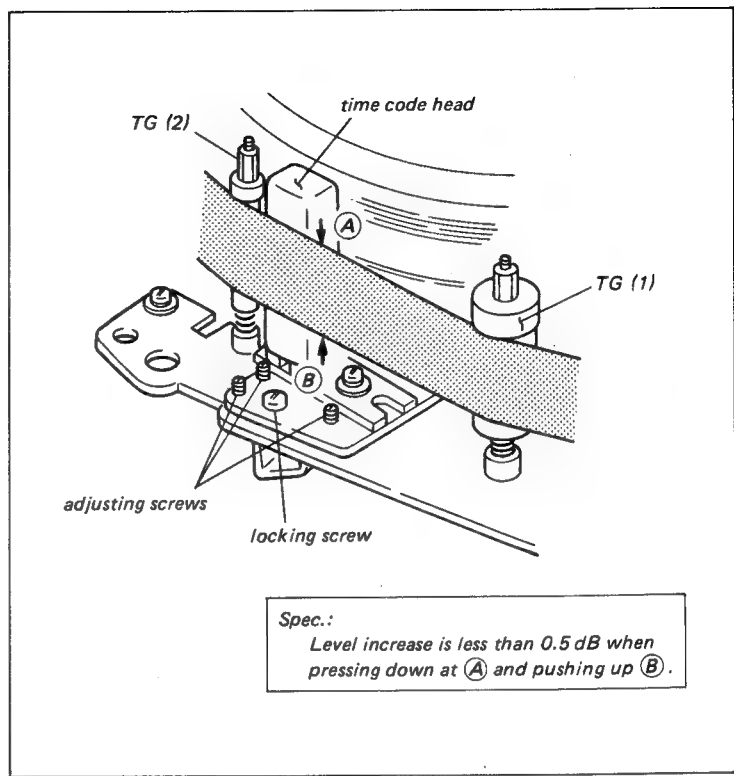
### Adjustment procedure:

Level increase is more than 0.5 dB when pressing down at A.

- (1) Loosen the locking screw 1/2 to 1/4 turns and turn 3 adjusting screws of exactly equal amount in clockwise direction.
- (2) Tighten the locking screw and check height again.

Level increase is more than 0.5 dB when pushing up at B.

- (3) Turn 3 adjusting screws of exactly equal amount in counter-clockwise direction.
- (4) Tighten the locking screw and check height again.



### 9-5-3. Time Code Head Zenith Adjustment

Tool: Flatness plate

#### Check procedure:

Check that the clearance between the time code head and the flatness plate meets the required specification, when the flatness plate is set on the time code head and TG-2.

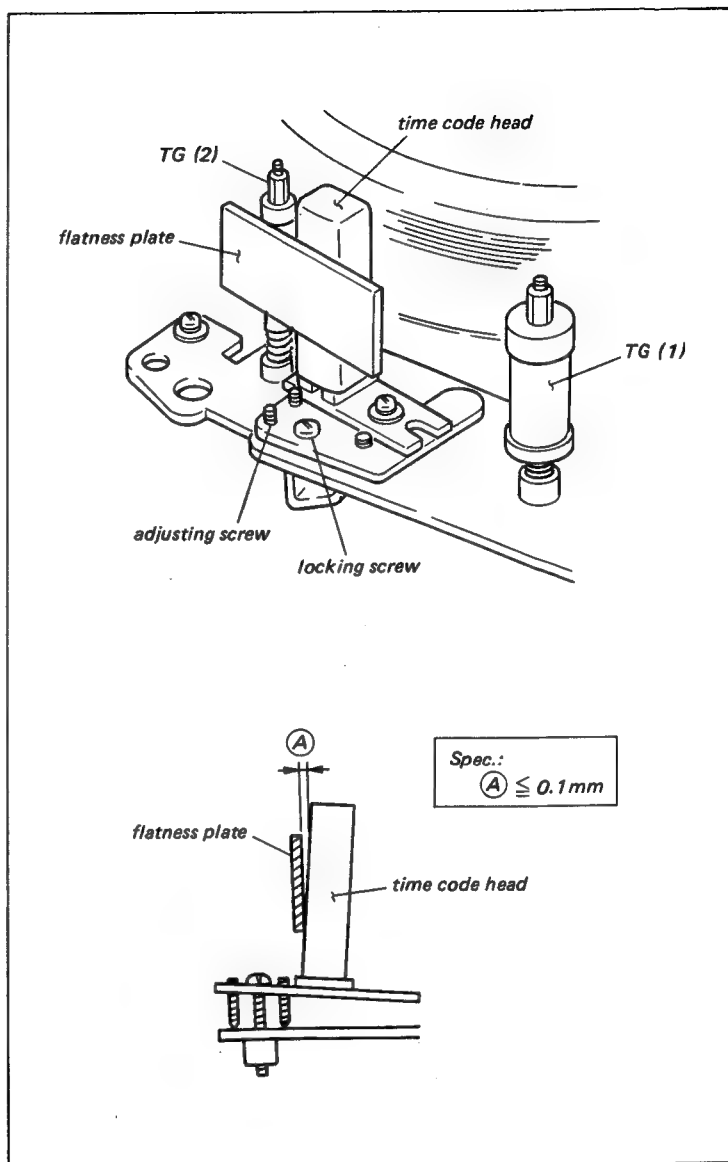
#### Adjustment procedure:

When the clearance is out of spec. at the top portion of the time code head.

- (1) Turn the adjusting screw in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.

When the clearance is out of spec. at the bottom portion of the time code head.

- (3) Loosen the locking screw 1/4 to 1/2 turns and turn the adjusting screw in clockwise direction.
- (4) Tighten the locking screw and check zenith again.



## 9-6. AUDIO HEAD ADJUSTMENT

### 9-6-1. Audio Head Height Adjustment

#### Tool:

Alignment tape, RR5-4SB

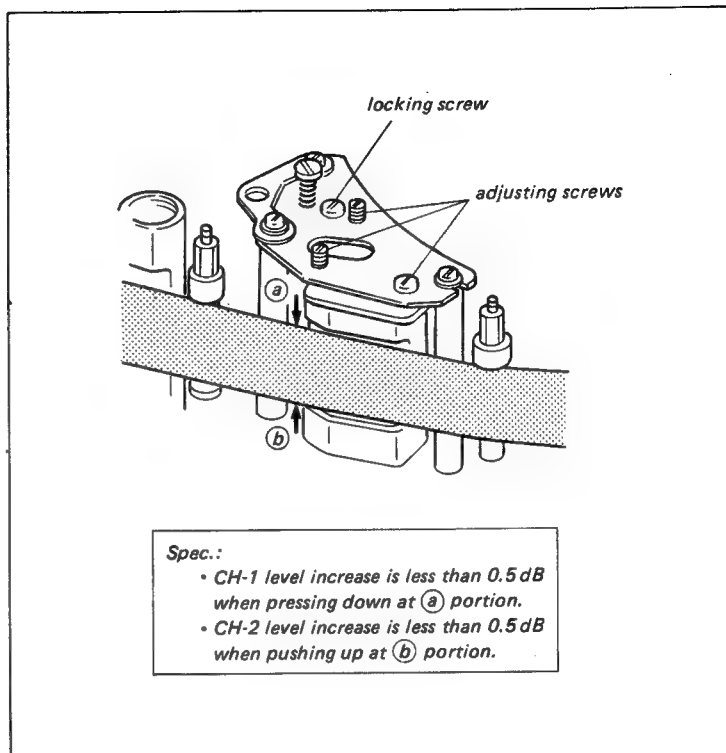
VTVM or Oscilloscope

#### Preparation:

- (1) Connect the VTVM or oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
- (2) Playback the audio 1 kHz portion of the alignment tape.

#### Check procedure:

- (1) Check that the CH-1 output level increase is less than 0.5 dB when pressing down at A. If not, perform the steps (1) and (2) of the adjustment procedure.
- (2) Check that the CH-2 output level increase is less than 0.5 dB when pushing up at B. If not, perform the steps (3) and (4) of the adjustment procedure.



#### Adjustment procedure:

- (1) Loosen the locking screw and turn the zenith height adjusting screws (R) and (F) counterclockwise at the same amount and turn the azimuth adjusting screw clockwise at the same amount.
- (2) Tighten the locking screw and check height again.
- (3) Loosen the locking screw and turn the zenith height adjusting screws (R) and (F) clockwise at the same amount and turn the azimuth adjusting screw counterclockwise at the same amount.
- (4) Tighten the locking screw and check height again.

## 9-6-2. Audio Head Zenith Adjustment

**Tool:** Flatness plate

### Check procedure:

Check that the clearance between the audio head and the flatness plate meets the required specification, when the flatness plate is set on the audio head and TG-3. Do not set the flatness plate on the upper portion of the TG-3.

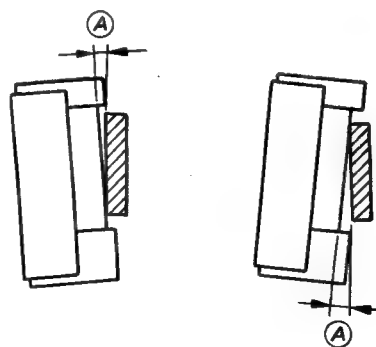
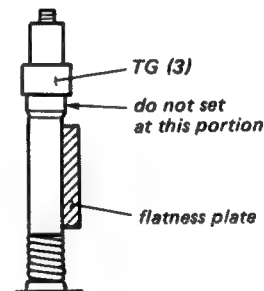
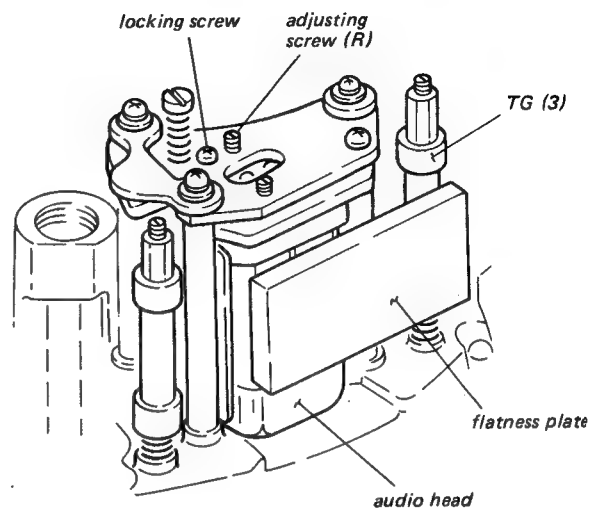
### Adjustment procedure:

.When the clearance is out of spec. at the top portion of the audio head.

- (1) Turn the adjusting screw (R) in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.

.When the clearance is out of spec. at the bottom portion of the audio head.

- (3) Loosen the locking screw 1/4 to 1/2 turns and turn the adjusting screw (R) in clockwise direction.
- (4) Tighten the locking screw and check zenith again.



Spec.:  
 $\textcircled{A} \leq 0.05 \text{ mm}$

### 9-6-3. Audio Head Azimuth Adjustment

#### Tool:

Alignment tape, RR5-4SB

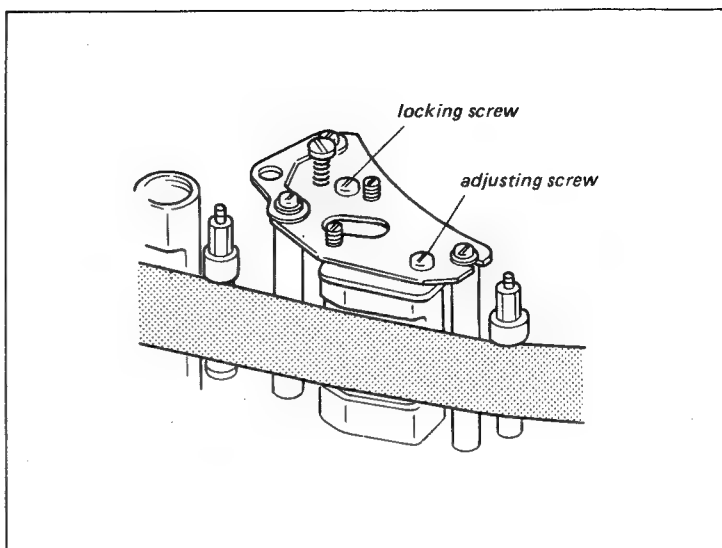
VTVM or oscilloscope

#### Preparation:

- (1) Connect the VTVM or oscilloscope to AUDIO OUT CH-1 or CH-2 terminal.
- (2) Playback the audio 10 kHz portion of the alignment tape.

#### Adjustment procedure:

- (1) Loosen the locking screw and adjust the maximum output level by turning the adjusting screw.
- (2) Tighten the locking screw.



### 9-6-4. Audio Head Phase Adjustment

#### Tool:

Alignment tape, RR5-4SB

Oscilloscope

#### Preparation:

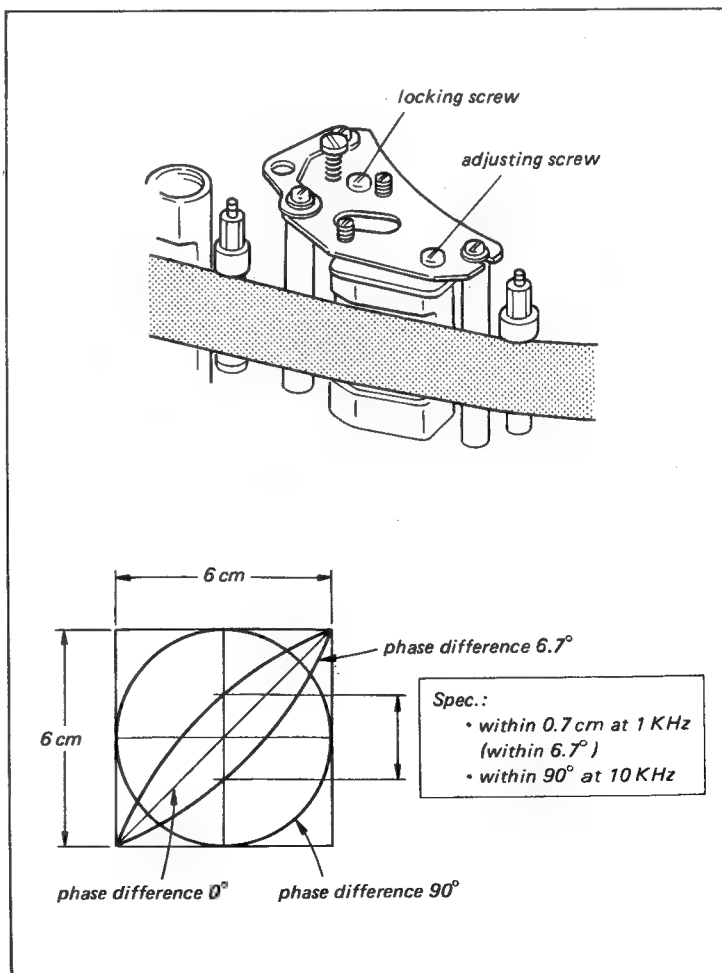
- (1) Connect the horizontal and vertical terminals of the oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
- (2) Playback the audio 1 kHz portion of the alignment tape.
- (3) Adjust the scope for horizontal and vertical amplitudes of 6 cm of a lissajous waveshape.

#### Check procedure:

Check that the vertical amplitude at the center in the horizontal direction is within the specification at 1 kHz and 10 kHz.

#### Adjustment procedure:

- (1) Loosen the locking screw 1/4 to 1/2 turns and adjust the phase by turning the adjusting screw.
- (2) Tighten the locking screw and confirm phase again.





## 9-7. AUDIO/CTL HEAD POSITION ADJUSTMENT

### Tool:

Alignment tape, RR5-4SB  
Oscilloscope

### Preparation:

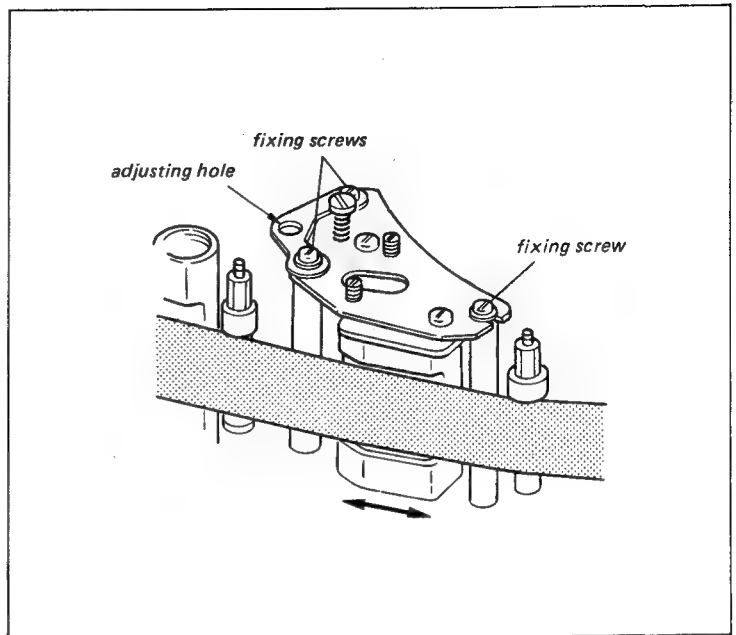
- (1) Connect the oscilloscope to TP6/YD-10 board, and externally trigger from TP3/YD-10 board.
- (2) Playback the color-bar portion of the alignment tape.
- (3) Set the DT SELECT switch to the OFF position.

### Check procedure:

Check that the RF waveform has the maximum amplitude when the TRACKING control knob is set in the detent position.

### Adjustment procedure:

Adjust the position of the audio/CTL head in the direction of the arrow.



## 9-8. VIDEO HEAD DIHEDRAL ADJUSTMENT

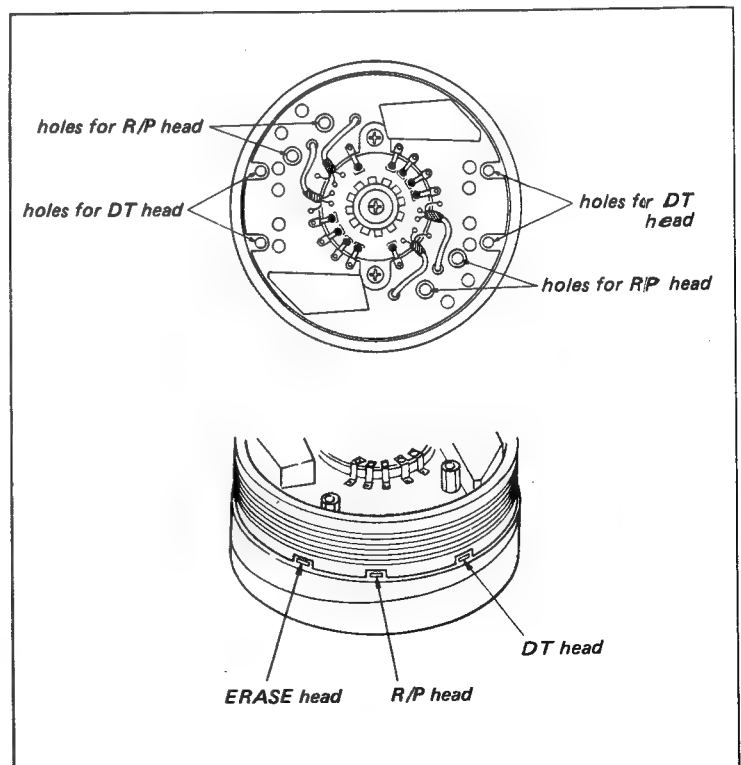
Perform this adjustment independently at R/P head and at DT head.

### Tool:

Dihedral adjusting screw (DT)  
Alignment tape, RR5-4SB  
Video monitor

### Check procedure:

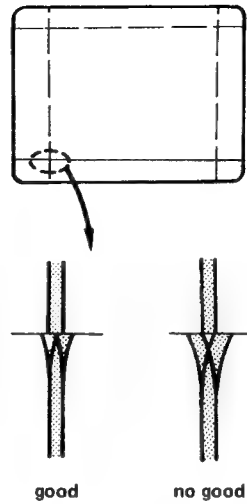
- (1) Set the DT SELECT switch to the OFF position on the front panel.
- (2) Playback the monoscope portion of the alignment tape.
- (3) Check that one vertical line beneath the switching point on the monitor screen looks divided into two separated lines which normally be one line. (Check for R/P head dihedral) (If one vertical line looks as two separate lines, dihedral adjustment is necessary. When one line is not divided into two lines, adjustment is not necessary.)



- (4) Set the DT SELECT switch to the SEARCH or VAR position.
- (5) Check as procedure (3) (Check for DT head dihedral)

**Adjustment procedure:**

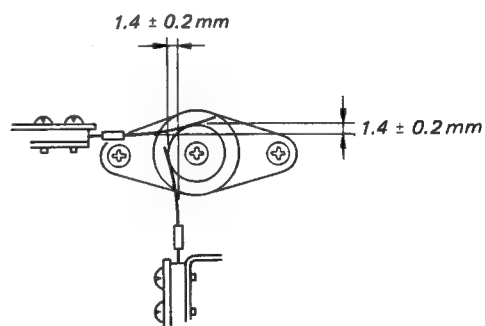
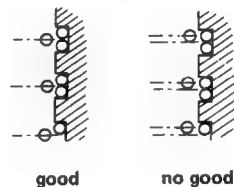
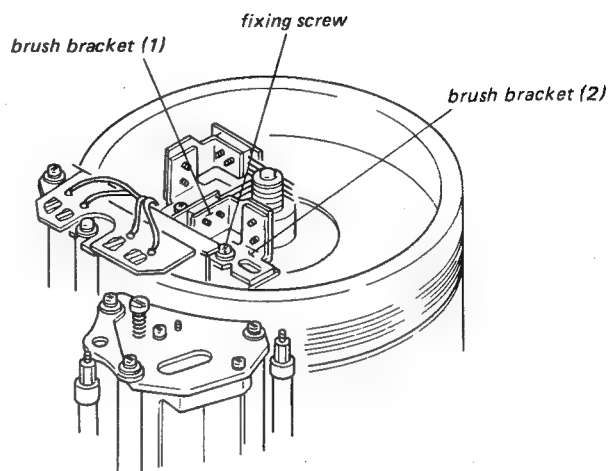
- (1) Screw lightly four dihedral adjusting screw (DT) into the holes A as shown in figure when the R/P head dihedral does not meet the required specification.  
If the DT head dihedral does not meet the required specification, screw four screws into the holes B.
- (2) When the R/P head dihedral does not meet the required specification, set the DT SELECT switch to the OFF position.  
When the DT head dihedral does not meet the required specification, set the DT SELECT switch to the SEARCH or VAR position. R/P head dihedral adjustment procedure and DT head dihedral adjustment procedure are same as follows.
- (3) Turn either of the two screws adjacent to the video head with white leads until some resistance is felt.
- (4) If this screw is turned further, the video head is moved and the dihedral is adjusted. Therefore, turn this screw an additional quarter turn.
- (5) Check for dihedral distortion. If the distortion has gotten worse, turn this screw back one turn and tighten the other screw a quarter turn. Check again for dihedral distortion and continue in this way until dihedral error is eliminated.
- (6) When the adjustment is completed, remove the four dihedral adjusting screws. After removal, playback the alignment tape and check dihedral again as error sometimes reappears after screws are removed.

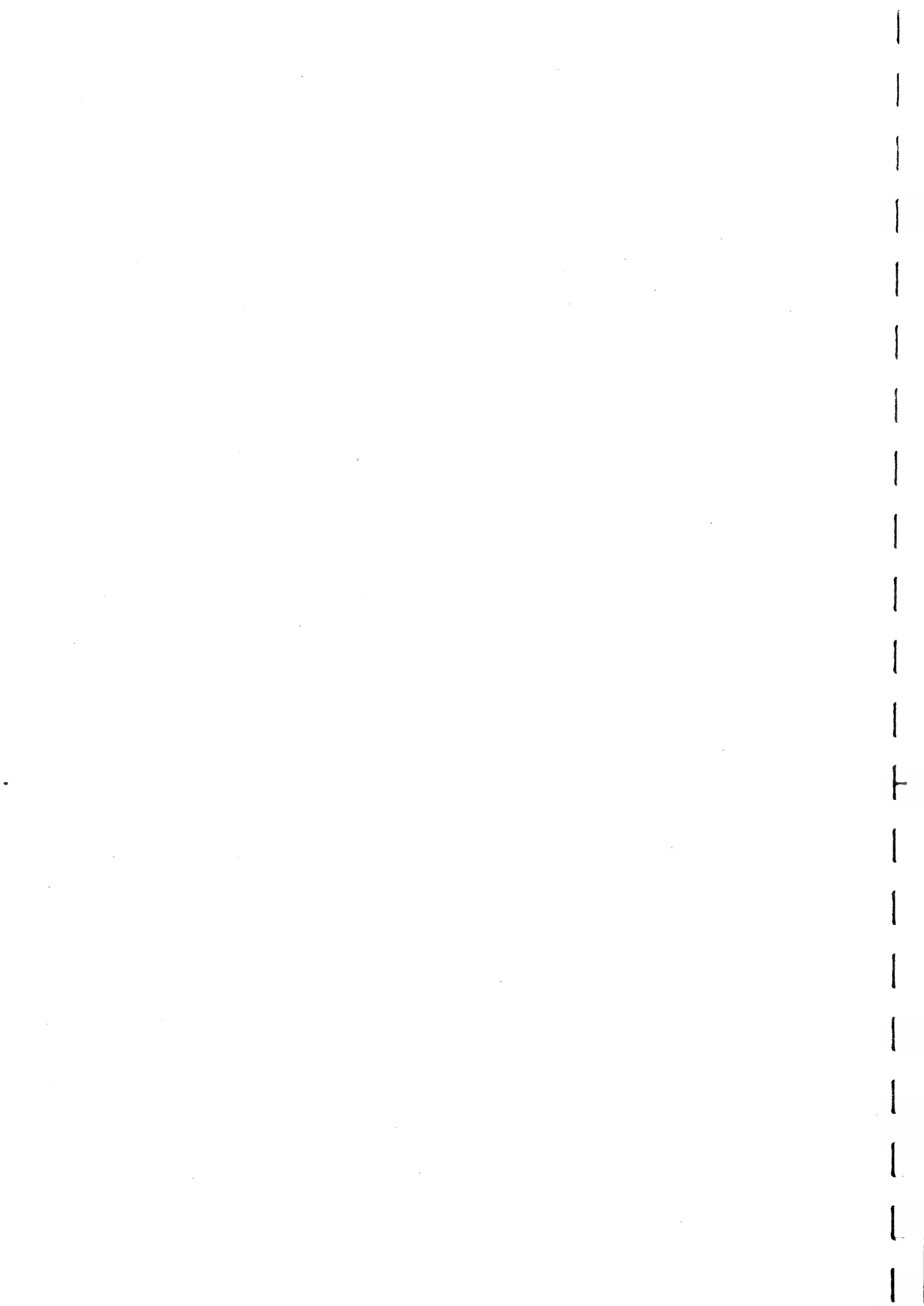


## 9-9. SLIP-RING AND BRUSH POSITION ADJUSTMENT

### Adjustment procedure:

- (1) Loosen the fixing screw of the brush bracket (2) and disengage the brush from the slip-ring. Tighten the fixing screw.
- (2) Loosen the fixing screw of the brush bracket (1). Adjust the height of the brush bracket (1) to meet the specification.
- (3) Loosen the fixing screw of the brush bracket (2) again. Adjust the position of the brush to meet the specification.





## SECTION 10

### POWER SUPPLY/SYSTEM CONTROL ALIGNMENT

#### [Equipment Required]

- DC Voltmeter
- Oscilloscope
- (BVE-500A or BVR-510A)

Note : Not always to readjust power line for slight out-of-specification so far as servo and video system are normal because it affects servo and video characteristic.

#### 10-1. SWITCHING REGULATOR ADJUSTMENT

##### 10-1-1. Excess Current Detector Circuit Adjustment

- (1) Turn off the Power Switch and turn the RV2 on PW-79 board fully counterclockwise. (component side view)
- (2) Turn on the Power Switch and adjust the voltage at TP305 on PD board to  $17.0 \pm 0.1V$  by RV1 on PW-79 board.

Caution : Care should be taken for adjustment of RV2 as it may damage many components if the voltage at TP305/PD board exceeds 17.1V.

- (3) Turn RV2 on PW-79 board gradually clockwise (component side view) until the voltage at TP305 on PD board will be 0V.

Note : Perform 10-1-2 output voltage adjustment successively.

##### 10-1-2. OUTPUT Voltage Adjustment

- (1) Turn off the Power Switch and turn the RV1 on PW-79 board fully counterclockwise. (component side view)
- (2) Wait two minutes or more, then turn on the Power Switch and set to the STOP mode. (with tape threaded)
- (3) Adjust the voltage at TP305 on PD board to  $15.5 \pm 0.1V$  with RV1 on PW-79 board.

Note : Confirm the specification of 10-2 REG5V adjustment and 10-3 REG12V adjustment when this output voltage adjustment is performed.

#### 10-2. REG5V ADJUSTMENT

##### «machine conditions for adjustment»

- STOP mode

##### «spec.»

- TP304/PD board
- $5.33 \pm 0.01V$

● RV2/PD board

#### 10-3. REG12V ADJUSTMENT

##### «machine conditions for adjustment»

- STOP mode

##### «spec.»

- TP301/PD board
- $12.0 \pm 0.1V$

● RV1/PD board

#### 10-4. TAPE BEGINNING/END DETECTOR ADJUSTMENT

##### «machine conditions for adjustment»

- STOP mode
- without cassette

##### «spec.»

- TP1/RE-3
- $6.0 \pm 0.2V$

● RV1/RE-3

#### 10-5. SEARCH $\times 10$ MODE DETECTOR ADJUSTMENT

##### «machine conditions for adjustment»

- FWD SEARCH  $\times 5$  mode (Just before click position)

##### «spec.»

- IC41-10/SY-36 or SY-92

- $A = 18.5 \pm 0.3\mu S$

● RV2/SY-36 or SY-92



## 10-6. PINCH ROLLER PRESSING TIMING ADJUSTMENT (1)

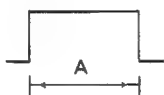
NOTE ; This adjustment is only performed in remote control with 36P remote connector.

### «machine conditions for adjustment»

- REMOTE/LOCAL SW ; REMOTE
- REMOTE 1/2 SW ; 2 (36P)
- Change the mode, REMOTE SEARCH STILL mode to REMOTE SEARCH FWD mode.  
(BVE-500A or BVR-510A is used in this adjustment.)

### «spec.»

- IC50-6/SY-36  
or SY-92



- $A = 180 \pm 3\text{ms}$

- RV1/SY-36  
or SY-92

## 10-7. PINCH ROLLER PRESSING TIMING ADJUSTMENT (2)

### «machine conditions for adjustment»

- Change the mode, STOP mode to PLAY mode.

### «spec.»

- IC50-10/SY-36  
or SY-92



- $A = 180 \pm 3\text{ms}$

- RV3/SY-36  
or SY-92

## SECTION 11 SERVO SYSTEM ALIGNMENT

### [Equipment Required]

- Oscilloscope
- Audio Oscillator
- Frequency Counter
- Alignment Tape
- RR5-4SB (Parts No. 8-960-015-16)

Time (min.)	Video	Audio	Time code
4	Monoscope	3kHz, 0dB	-
5	Color bars	-	1.2kHz
5	R-F sweep	-	-
2	Modulated 20T pulse	1kHz, 0dB	-
2	Monoscope with burst	10kHz, -10dB	-
2	Pseudo C.B. for DOC adj	-	-

### [Definition of Mode]

Mode	Frequency at TP11 on SV-24 board. (Hz)
PLAY	approx. 450
SEARCH $\times 1/30$	approx. 15
SEARCH $\times 1/10$	approx. 40
SEARCH $\times 1/5$	approx. 83
SEARCH $\times 1/2$	approx. 220
SEARCH $\times 1$	approx. 444
SEARCH $\times 2$	approx. 890
SEARCH $\times 5$	approx. 2230
SEARCH $\times 10$	approx. 450 (Click position)

### [Switch Setting]

\* Front Panel  
 INPUT SELECT ..... LINE  
 REMOTE/LOCAL ..... LOCAL  
 DT SELECT ..... OFF  
 PB/PB • EE ..... PB • EE

### 11-1. CAPSTAN FG BIAS ADJUSTMENT

#### «machine conditions for adjustment»

- STOP mode

#### «spec.»

- TP11/SV-24
- DUTY =  $50 \pm 2\%$

RV14/SV-24

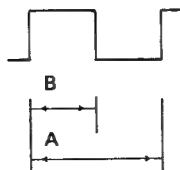
#### «spec.»

- TP12/SV-24
- DUTY =  $50 \pm 2\%$

RV17/SV-24

NOTE ;

$$\text{DUTY} = \frac{B}{A}$$



### 11-2. DRUM FREE SPEED ADJUSTMENT

#### «machine conditions for adjustment»

- STOP mode

#### «spec.»

- TP5/SV-24
- DUTY =  $50 \pm 2\%$

RV4/SV-24

NOTE ; After completing this adjustment, perform the section 11-12. Drum Lock Phase Adjustment (RV4 fine adj.).

### 11-3. CAPSTAN FREE SPEED ADJUSTMENT

#### «machine conditions for adjustment»

- STOP mode

#### «spec.»

- TP7/SV-24
- DUTY =  $60 \pm 2\%$

RV11/SV-24

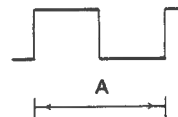
### 11-4. SEARCH $\times 5$ ADJUSTMENT

#### «machine conditions for adjustment»

- FWD SEARCH  $\times 5$  mode

#### «spec.»

- TP12/SV-24



- A =  $0.44 \pm 0.01\text{ms}$

RV3/SV-24

NOTE ; After completing this adjustment, perform thesection 11-6. SEARCH  $\times 1$  adjustment (RV3 fine adj.).

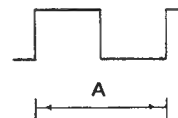
### 11-5. SEARCH $\times 1/30$ ADJUSTMENT

#### «machine conditions for adjustment»

- FWD SEARCH  $\times 1/30$  mode

#### «spec.»

- TP12/SV-24



- A =  $67 \pm 10\text{ms}$

RV15/SV-24

### 11-6. SEARCH × 1 ADJUSTMENT (RV3 fine adj.)

«machine conditions for adjustment»

- FWD SEARCH × 1 mode
- MODE SELECT SW ; TBC

«spec.»

- TP12/SV-24
- $444 \pm 2\text{Hz}$

● RV3/SV-24

### 11-7. TRACKING CONTROL CALIBRATION

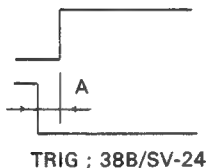
«machine conditions for adjustment»

- Playback mode ; Alignment tape (Color bar segment)
- TRACKING ; FIXED

«spec.»

- 38B/SV-24

- TP501/CF-8



- $A = 0 \pm 0.05\text{ms}$

● RV1/SV-24

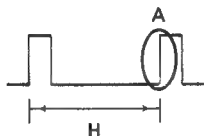
### 11-8. DRUM AFC (H period) ADJUSTMENT

«machine conditions for adjustment»

- Change the mode, PLAY mode to STILL (SEARCH) mode.

«spec.»

- TP2/SV-24



- Oscilloscope DELAY mode at A portion.
- H period (in PLAY mode)  $\pm 0.05\mu\text{S}$  = H period (in STILL mode)

● RV13/SV-24

### 11-9. AFC BIAS ADJUSTMENT

«machine conditions for adjustment»

- Change the mode, STILL (SEACH) mode to PLAY mode.

«spec.»

- TP9/SV-24
- The dc level at STILL mode = The dc level at PLAY mode

● RV12/SV-24

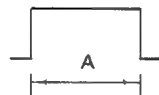
### 11-10. CAPSTAN SPEED DETECTOR ADJUSTMENT

«machine conditions for adjustment»

- FWD SEARCH × 1/30 mode

«spec.»

- IC28-6/SV-24



- $A = 0.67 \pm 0.01\text{ms}$

● RV2/SV-24

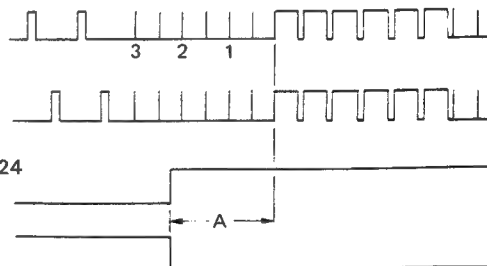
### 11-11. SWITCHING POSITION ADJUSTMENT

«machine conditions for adjustment»

- Playback mode ; Alignment tape (Color bar segment)
- Short between TP3 and GND/SV-24 with jumper.
- Short between TP2 and GND/SV-24 with jumper.
- TRACKING ; FIXED

«spec. at the adjustment»

- 5A/SV-24



- TP18/SV-24

- $A = 2.25 \pm 0.15\text{H}$

● RV6/SV-24 (rising)

● RV8/SV-24 (falling)

«spec. at the checking»

- $A = 2.25 \pm 0.75\text{H}$   
 $1.75\text{H}$

NOTE : Once the switching position adjustment is completed to  $2.25\text{H} \pm 0.15\text{H}$ , if the data measured using another alignment tape is within  $0.5\text{H} - 3.0\text{H}$ . This is acceptable because of tape tolerance.



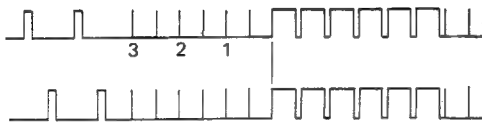
## 11-12. DRUM LOCK PHASE ( $\phi^2$ LOOP) ADJUSTMENT (RV4 fine adj.)

### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; Color bar
- Short between TP3 and GND/SV-24 with jumper.
- Short between TP2 and GND/SV-24 with jumper.
- Short between IC100-6 pin (or IC5-6 pin) and GND/SV board with jumper. (S/N. up to 10645)  
(S/N. 10646 and higher)

### «spec.»

- TP15/SV-24



- TP18/SV-24



- $A = 2.25 \pm 0.15H$

- RV4/SV-24

## 11-13. PICTURE SPLITTING COMPENSATOR ADJUSTMENT

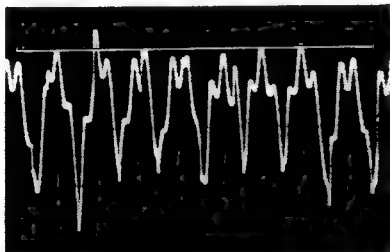
NOTE ; This adjustment is not necessary in normal service operation except when the variable resistor, upper drum assy and/or drum assy is replaced.

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (monoscope segment)

### «spec.»

- TP19/SV-24



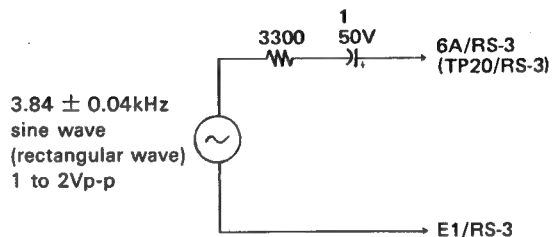
- Flatten the peak level as possible as maximum level.

- RV9/SV-24
- RV10/SV-24

## 11-14. TAKE UP REEL MOTOR SPEED ADJUSTMENT

### «machine condetions for adjustment»

- Cassette up mode
- Confirm that dc level at TP24 on RS-3 board is  $12 \pm 0.2V$ .
- Connect the sine wave (or rectangular wave) at 6A on RS-3 board.



### «spec.»

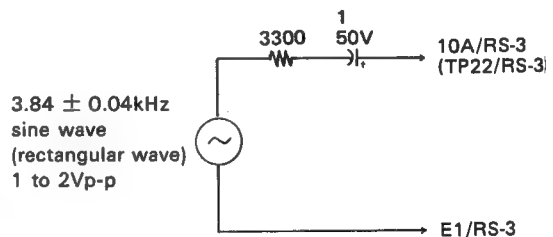
- TP4/RS-3
- $5 \pm 0.05V$

- RV1/RS-3

## 11-15. SUPPLY REEL MOTOR SPEED ADJUSTMENT

### «machine conditions for adjustment»

- Cassette up mode
- Confirm that dc level at TP24 on RS-3 board is  $12 \pm 0.2V$ .
- Connect the sine wave (or rectangular wave) at 10A on RS-3 board.



### «spec.»

- TP10/RS-3
- $5 \pm 0.05V$

- RV2/RS-3

### NOTE ;

RV16/SV board (Capstan Synchronized Adjustment)  
This adjustments is not necessary to perform BVU-820.

### NOTE ;

RV2/RE-3 (Take-up Reel Motor Current Sense Adjustment)  
RV3/RE-3 (Supply Reel Motor Current Sense Adjustment)  
RV501/RS-4 (T Tension Detector 0 gram Point Adjustment)  
RV502/RS-4 (T Tension Detector 100 gram Point Adjustment)  
RV503/RS-4 (S Tension Detector 0 gram Point Adjustment)  
RV504/RS-4 (S Tension Detector 100 gram Point Adjustment)  
Refer to the Mechanical Alignment.

## 11-16. DYNAMIC TRACKING CONTROL SYSTEM ADJUSTMENT

- NOTE 1 ;
- Turn the S1/DT board "ON", after adjustment turn "OFF".
  - Turn the S2/DT board "OFF", after adjustment turn "ON". (Serial No. 10646 and higher or P.C. board parts No. 1-606-919-14 and later.
  - Remove the jumper between PIN8 and PIN14 of IC16/DT board, after adjustment reconnect the jumper to unsoldered portion.
  - Preset the variable resistor facing to the component side.

### «Adjustment of RV3/DT board»

- Turn RV13/DT board(CH-B) to fully counterclockwise.
- Perform the section 11-16-11. DT Slope Offset Adjustment.
- Perform the section 11-16-12. Automatic Tracking Gain Adjustment.

### «Adjustment of RV4/DT board»

- Perform the section 11-16-11. Wobbling Gain Adjustment.

### «Adjustment of RV5/DT board»

- Turn RV4/DT board(CH-B) to fully counterclockwise.
- Perform the section 11-16-6. Hysteresis Cancel Level Adjustment.
- Perform the section 11-16-11. Wobbling Gain Adjustment.

### «Adjustment of RV7 or RV8/DT board»

- Turn RV13/DT board(CH-B) to fully counterclockwise.
- Turn RV14/DT board(CH-A) to fully clockwise.
- Perform the section 11-16-10. DT Slope Level Adjustment.
- Perform the section 11-16-12. Automatic Tracking Gain Adjustment.

### «Adjustment of RV13 or RV14/DT board»

- Perform the section 11-16-12. Automatic Tracking Gain Adjustment.

### «Adjustment of either RV9,RV10,RV11,RV12,RV15 or RV16/DT board»

- Perform the section 11-16-13. DT Self-record/Playback Adjustment.

### «Adjustment of RV19/DT board»

- Perform the section 11-16-1. Drum Rotation Detector Adjustment.

### NOTE 2 ;

#### «Adjustment of A or B channel»

- DT mode (Turn DT SELECT switch "VAR").
- Connect the oscilloscope to TP6 and TP3/YD board and set into CHOP mode.

CH-A (TP3/YD board is "LOW" level.)

CH-B (TP3/YD board is "HIGH" level.)

- Perform section 11-16-1. to section 11-16-13. for A or B channel.

### NOTE 3 ;

#### «Adjustments of all variable resistor on DT board.»

- Perform section 11-16-1. to section 11-16-13.

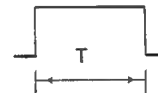
## 11-16-1. Drum Rotation Detector Adjustment

### «machine conditions for adjustment»

- Change the mode, STANDBY mode to STANDBY OFF mode. (Perform this adjustment while the drum is rotating.)

### «spec.»

- TP38/DT board (IC63-10)



- $T = 19 \pm 0.5\text{ms}$

- RV19/DT board

## 11-16-2. Preparation for DT Adjustment

- Turn RV4/DT board to fully counterclockwise.
- Turn RV7/DT board (CH-B) to fully counterclockwise.
- Turn RV8/DT board (CH-A) to fully counterclockwise.
- Turn RV13/DT board (CH-B) to fully counterclockwise.
- Turn RV14/DT board (CH-A) to fully clockwise.
- Turn RV15/DT board (CH-B) to fully clockwise.
- Turn RV16/DT board (CH-A) to fully clockwise. (adjust from component side)

- Turn the S1/DT board "ON", after adjustment turn "OFF".

- Turn the S2/DT board "OFF", after adjustment turn "ON". (Serial No. 10646 and higher or P.C. board parts No. 1-606-919-14 and later.

- Remove the jumper between PIN8 and PIN14 of IC16/DT board after adjustment reconnect jumper to unsoldered portion.

- Oscilloscope TRIG ; TP5/DT board

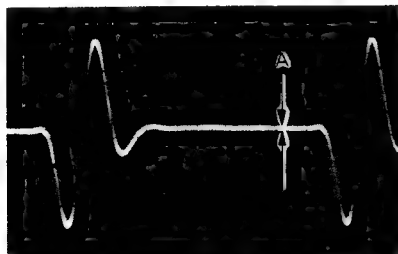
### 11-16-3. DT Slope Offset Preadjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

«spec.»

- TP23/DT board



- Straighten at "A" portion. (Be horizontal.)

RV3/DT board

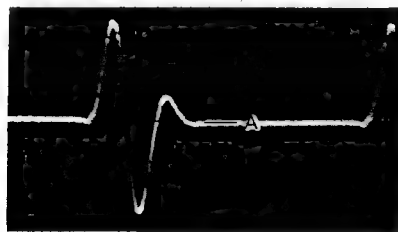
### 11-16-4. DT Operating Point Preadjustment (NORMAL)

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

«spec.»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- Adjust the DC level at "A" portion to  $0 \pm 5V$ .

RV10/DT board (CH-B)

RV12/DT board (CH-A)

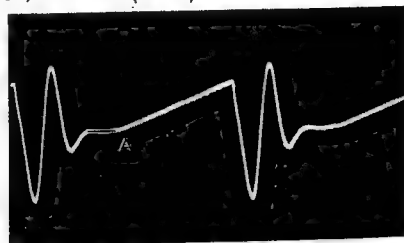
### 11-16-5. DT Operating Point Preadjustment (FWD $\times 2$ )

«machine conditions for adjustment»

- FWD SEARCH  $\times 2$  mode
- DT SELECT SW ; VAR

«spec.»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- Adjust the DC level at "A" portion to  $0 \pm 5V$ .

RV9/DT board (CH-B)

RV11/DT board (CH-A)

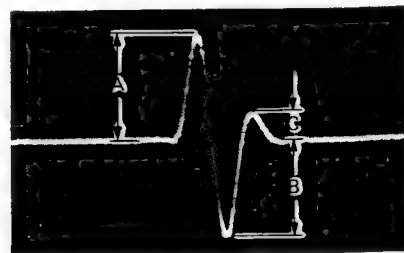
### 11-16-6. Hysteresis Cancel Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

«spec.»

- TP101/PD board (CH-B)



- $A = 100 \pm 10V$ ,  $B = 90 \pm 10V$ ,  $C = 28 \pm 4V$

RV5/DT board

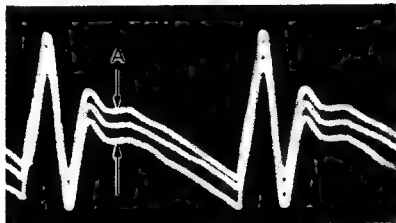
### 11-16-7. DT Gain Preadjustment

«machine conditions for adjustment»

- FWD SEARCH  $\times 1/30$  mode
- DT SELECT SW ; VAR

«spec.»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- DC level's maximum fluctuation at "A" portion =  $65 \pm 5V$ .

●RV15/DT board (CH-B)

●RV16/DT board (CH-A)

NOTE: The DC level (portion A) will not fluctuate without turning RV15 or RV16.

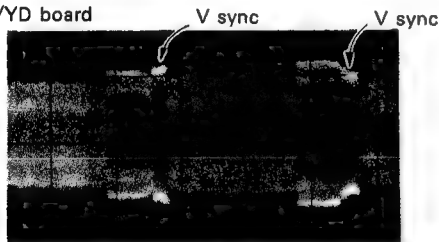
### 11-16-8. DT Operating Point (RV10,12 fine adj.)

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- Turn the DT SELECT SW "OFF", and then maximize waveform at TP6/YD board with TRACKING VR.
- Next turn the DT SELECT SW "VAR".

«spec. 1»

- TP6/YD board



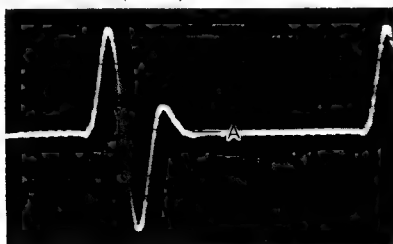
- Maximize the V sync level.

●RV10/DT board (CH-B)

●RV12/DT board (CH-A)

«spec. 2»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- The DC level at "A" portion is  $0 \pm 17V$ .

Satisfy the spec. 1 and the spec. 2.

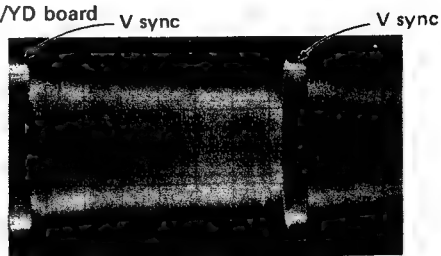
### 11-16-9. DT Gain Adjustment (RV15,16 fine adj.)

«machine conditions for adjustment»

- FWD SEARCH  $\times 1/30$  mode
- DT SELECT SW ; VAR

«spec.»

- TP6/YD board



- Maximize the V sync level.

●RV15/DT board (CH-B)

●RV16/DT board (CH-A)

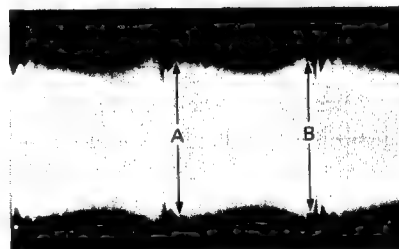
### 11-16-10. DT Slope Level Adjustment

«machine conditions for adjustment»

- REV SEARCH  $\times 1$  mode
- DT SELECT SW ; VAR

«spec.»

- TP6/YD board



- $A \cong B$

●RV7/DT board (CH-B)

●RV8/DT board (CH-A)

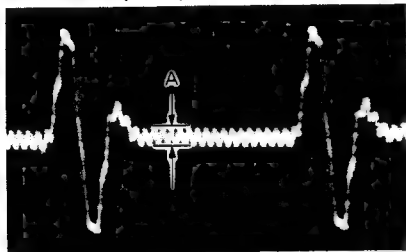
### 11-16-11. Wobbling Gain/DT Slope Offset Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

«spec.»

- TP101/PD board (CH-B)



- $A = 11 \pm 1V$

⦿RV4/DT board (gain)

- Straighten at wobbling portion. (The slope is within 5V.)

⦿RV3/DT board (slope offset)

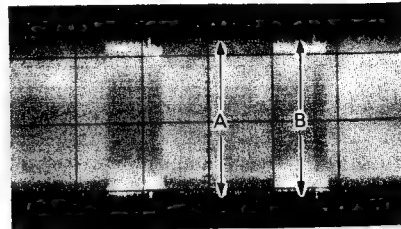
### 11-16-12. Automatic Tracking Gain Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR
- Short between TP35 and GND/DT board with jumper.

«spec.»

- TP6/YD board

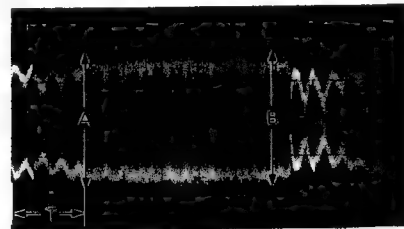


- Made to 70 percent of maximum level.

⦿TRACKING VR

«spec.»

- TP6/YD board



$T = 8ms$  (R64/DT-3 = 100K)  
 $T = 4ms$  (R64/DT-3 = 51 K)

- $A \cong B$

⦿RV13/DT board (CH-B)

(Turn in fully counterclockwise first, and then turn slowly in clockwise to meets the specification.)  
 (adjust from component side)

⦿RV14/DT board (CH-A)

(Turn in fully clockwise first, and then turn slowly in counter-clockwise to meets the specification.)  
 (adjust from component side)

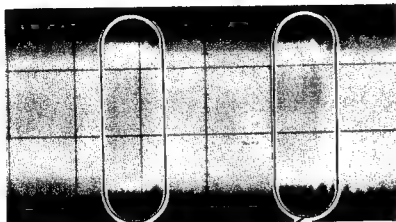
### 11-16-13. DT Self-record/Playback Adjustment

#### «machine conditions for adjustment»

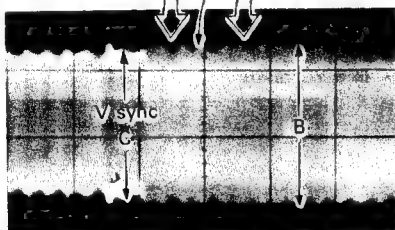
- VIDEO IN ; color bar
- PB/PB-EE SW ; PB
- DT SELECT SW ; VAR
- Playback self-recorded portion.

#### «spec. 1»

- TP6/YD board



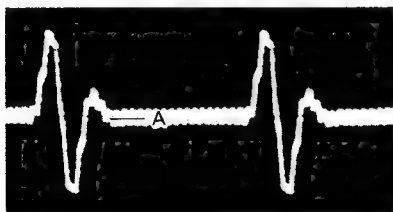
- Oscilloscope : DELAY mode



- Maximize the level of V sync portion.
- Adjust the frequency at "A" portion to two times of wobbling frequency. (wobbling frequency : 840Hz)
- $\frac{C}{B}$  = more than 0.95 (CONFI mode)  
= more than 0.8 (REV SEARCH  $\times 1$ , PLAY, FWD  $\times 1/30$ , FWD  $\times 2$  and FWD  $\times 3$  modes)

#### «spec. 2»

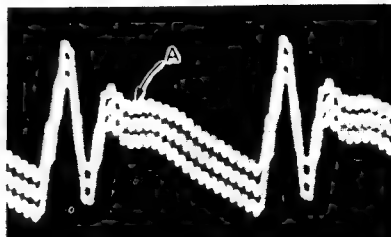
- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- To check that the DC level at "A" portion is  $0 \pm 17V$ .

#### «spec. 3»

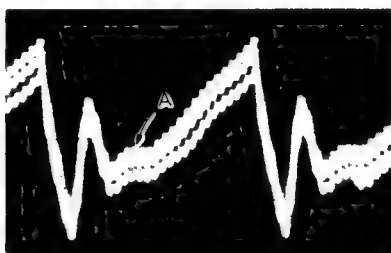
- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- To check that the DC level at "A" portion is more than spec.2 DC level.

#### «spec. 4»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- To check that the positive going peak DC level and the negative going peak DC level are equal on the reference of spec.2 DC level.

Playback the self-recorded portion.

- Fine adjust the following variable resistor to meet the specification 1.

RV10/DT board (CH-B)

RV12/DT board (CH-A)

- Check that the specification 2 is met.



CONFI mode.  
Turn PB/PB-EE SW "PB" in REC mode.

- Fine adjust the following variable resistor to meet the specification 1.

RV15/DT board (CH-B)

RV16/DT board (CH-A)



Playback the self-recorded portion in FWD  $\times 1/30$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV15/DT board (CH-B)

●RV16/DT board (CH-A)

- Check that the specification 3 is met.



Playback the self-recorded portion in REV  $\times 1$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV15/DT board (CH-B)

●RV16/DT board (CH-A)



Playback the self-recorded portion in FWD  $\times 2$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV9/DT board (CH-B)

●RV11/DT board (CH-A)

- Check that the specification 4 is met.



Playback the self-recorded portion in FWD  $\times 3$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV9/DT board (CH-B)

●RV11/DT board (CH-A)

Repeat the above adjustments two or three times to meet all specifications.

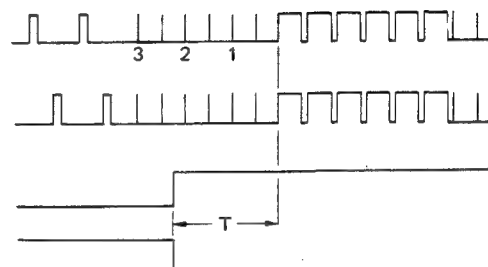
## 11-17. DT SWITCHING POSITION ADJUSTMENT

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- TRACKING ; FIXED
- DT SELECT SW ; VAR
- Short between TP2 and GND/SV board with jumper.

### «spec.»

- 5A/SV board



- TP18/SV board

- $T = 2.25 \pm 0.15H$

●RV7/SV board (rising)

●RV5/SV board (falling)

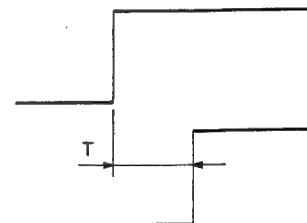
## 11-18. DT $\times 2$ , $\times 3$ mode SWITCHING POSITION ADJUSTMENT

### «machine conditions for adjustment»

- FWD SEARCH  $\times 2$  or  $\times 3$  mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR
- MODE SELECT SW ; TBC

### «spec.»

- TP4/FC board



- TP5/FC board

- $T = 320 \pm 10\mu S$

●RV1/FC board

## 11-19. ASSEMBLE COMPENSATOR ADJUSTMENT



NOTE; 1. Perform adjustments of section 11-2 (Drum Free Speed), section 11-11 (Switching Position) and 11-12 (Drum Lock Phase) before this adjustment.

2. Applicable serial No. 10646 and later. (U/C)  
(P.C. board part No. 1-604-339-15 and later.)

### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; color bar

### «spec.»

- TP15/SV board 
  - IC100-6/SV board  
(or IC5-6/SV board) 
- equalize the phase

- RV100/SV board



## SECTION 12

### AUDIO SYSTEM ALIGNMENT

#### [Equipment Required]

- Audio Oscillator
- Audio Attenuator
- VTVM
- Frequency Counter
- Oscilloscope
- Blank Tape
- Alignment Tape
- RR5-4SB (Parts No. 8-960-015-16)

Time (min.)	Video	Audio	Time code
4	Monoscope	3kHz,0dB	-
5	Color bars	-	1.2kHz
5	R-F sweep	-	-
2	Modulated 20T pulse	1kHz,0dB	-
2	Monoscope with burst	10kHz,-10dB	-
2	Pseudo C.B. for DOC adj	-	-

#### [Switch/VR Setting]

- \* Front Panel
- AUDIO MONITOR ..... CH-1
- TRACKING ..... FIXED
- VIDEO ..... AUTO
- AUDIO LIMITER ..... OFF
- MIXING SELECT ..... OFF
- MODE SELECT ..... NORMAL
- INPUT SELECT ..... LINE
- SKEW ..... CLICK
- REMOTE 1/2 ..... 2 (36P)
- REMOTE/LOCAL ..... LOCAL
- DT SELECT ..... OFF
- PB/PB • EE ..... PB • EE
- \* Rear Panel
- AUDIO IN LEVEL ..... LOW

#### 12-1. AUDIO LEVEL CONTROL SETTING

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB

##### «spec.»

- 21A/AU-13 (CH-1)
- $0 \pm 0.5\text{dB}$

##### ●RV1/AO-3

##### «spec.»

- 34A/AU-13 (CH-2)
- $0 \pm 0.5\text{dB}$

##### ●RV105/AU-13 (CH-2)

NOTE ; The AUDIO LEVEL CONTROL should not be touched until rest of section 12 AUDIO SYSTEM ALIGNMENT are completed.

#### 12-2. OUTPUT LEVEL ADJUSTMENT

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB

##### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

##### ●RV1/AO-3

##### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

##### ●RV2/AO-3

#### 12-3. MONITOR OUT LEVEL ADJUSTMENT

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB
- AUDIO MONITOR SW ; CH-1

##### «spec.»

- AUDIO MONITOR OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

##### ●RV3/AO-3

##### Reference

(AUDIO MONITOR SW ; at MIX  $7 \pm 2\text{dB}$ )

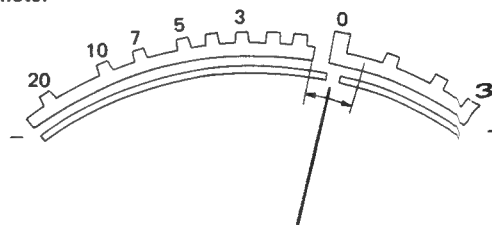
#### 12-4. LEVEL METER CALIBRATION

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB

##### «spec.»

- VU meter



- $0 \pm 0.5$  scale

##### ●RV5/AU-13 (CH-1)

##### «spec.»

- $0 \pm 0.5$  scale

##### ●RV105/AU-13 (CH-2)

## 12-5. LIMITER LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -30dB
- LIMITER SW ; ON

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- $7 \pm 0.5\text{dB}$

●RV3/AU-13 (CH-1)

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- $7 \pm 0.5\text{dB}$

●RV103/AU-13 (CH-2)

## 12-6. PLAYBACK FREQUENCY RESPONSE /LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (1kHz/10kHz segment)

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- 10kHz PB Level
- $= (1\text{kHz PB Level} - 10\text{dB}) \pm 1.5\text{dB}$

●RV1/AU-13 (CH-1)

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- 10kHz PB Level
- $= (1\text{kHz PB Level} - 10\text{dB}) \pm 1.5\text{dB}$

●RV101/AU-13 (CH-2)

## 12-7. PLAYBACK OUTPUT LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- PLAYback mode ; Alignment tape (1kHz segment)
- Adjust the AUDIO PB LEVEL at same degrees of AUDIO REC LEVEL.

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

●RV2/AU-13 (CH-1)

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

●RV102/AU-13 (CH-2)

## 12-8. BIAS OSCILLATOR FREQUENCY ADJUSTMENT

### «machine conditions for adjustment»

- REC mode

### «spec.»

- TP501/AU-25
- $70 \pm 2\text{kHz}$

●LV501/AU-25

## 12-9. AUDIO ERASE CURRENT ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode

### «spec.»

- TP504/AU-25
- Maximum level

●LV506/AU-25

## 12-10. AUDIO ERASE CURRENT ADJUSTMENT (2)

### «machine conditions for adjustment»

- CH-1 INSERT mode

### «spec.»

- TP504/AU-25
- Maximum level

●LV505/AU-25

## 12-11. AUDIO ERASE CURRENT ADJUSTMENT (3)

### «machine conditions for adjustment»

- CH-2 INSERT mode

### «spec.»

- TP504/AU-25
- Maximum level

●LV504/AU-25

## 12-12. RECORD BIAS CURRENT ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode
- Turn RV501/AU-25 fully counterclockwise. (CH-1)  
(adjust from soldering side)
- Turn RV502/AU-25 fully counterclockwise. (CH-2)  
(adjust from soldering side)

### «spec.»

- TP502/AU-25 (CH-1)
- Maximum level

⦿ LV502/AU-25 (CH-1)

### «spec.»

- TP503/AU-25 (CH-2)
- Maximum level

⦿ LV503/AU-25 (CH-2)

NOTE ; After completing this adjustment, perform the section  
12-16. Record Bias Current Adjustment (2).

## 12-13. BIAS TRAP ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode
- AUDIO IN ; no signal

### «spec.»

- TP2/AU-13 (CH-1)
- Minimum level

⦿ LV2/AU-13 (CH-1)

### «spec.»

- TP102/AU-13 (CH-2)
- Minimum level

⦿ LV102/AU-13 (CH-2)

## 12-14. BIAS TRAP ADJUSTMENT (2)

### «machine conditions for adjustment»

- CH-1 INSERT mode

### «spec.»

- TP101/AU-13
- Minimum level

⦿ LV101/AU-13

## 12-15. BIAS TRAP ADJUSTMENT (3)

### «machine conditions for adjustment»

- CH-2 INSERT mode

### «spec.»

- TP1/AU-13
- Minimum level

⦿ LV1/AU-13

## 12-16. RECORD BIAS CURRENT ADJUSTMENT (2)

### «machine conditions for adjustment»

- REC mode

### «spec.»

- TP1/AU-13 (CH-1)
- 12mVrms

⦿ RV501/AU-25 (CH-1)

### «spec.»

- TP101/AU-13 (CH-2)
- 12mVrms

⦿ RV502/AU-25 (CH-2)

## 12-17. RECORD CURRENT LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- REC mode
- AUDIO IN : 1 kHz, -60dB
- Turn RV7/AU-13 fully counterclockwise. (CH-1)  
(adjust from soldering side)
- Turn RV107/AU-13 fully counterclockwise. (CH-2)  
(adjust from soldering side)

— S/N. up to 10645 —

### «spec.»

- TP3/AU-13 (CH-1)
- $-1 \pm 1.0\text{dB}$

⦿ RV4/AU-13 (CH-1)

### «spec.»

- TP103/AU-13 (CH-2)
- $-1 \pm 1.0\text{dB}$

⦿ RV104/AU-13 (CH-2)

NOTE ; After completing this adjustment, perform the section  
12-19. Record Current Frequency Response Adjustment (2).

## 12-18. RECORD CURRENT FREQUENCY RESPONSE ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode
- AUDIO IN : 18kHz, -90dB
- Turn RV7/AU-13 fully counterclockwise. (CH-1)  
(adjust from soldering side)
- Turn RV107/AU-13 fully counterclockwise. (CH-2)  
(adjust from soldering side)

(U/C: S/N up to 10645)  
(PM: S/N up to 10005)

### «spec.»

- TP3/AU-13 (CH-1)
- Maximum level

● LV3/AU-13 (CH-1)

### «spec.»

- TP103/AU-13 (CH-2)
- Maximum level

● LV103/AU-13 (CH-2)

NOTE : After completing this adjustment, perform the section 12-19. Record Current Frequency Response Adjustment (2).

(U/C: S/N up to 10645)  
(PM: S/N up to 10005)

## 12-19. RECORD CURRENT FREQUENCY RESPONSE ADJUSTMENT (2)

(U/C: S/N up to 10645)  
(PM: S/N up to 10005)

### «machine conditions for adjustment»

- REC mode
- AUDIO IN : 10kHz, -60dB

### «spec.»

- TP3/AU-13 (CH-1)
- Maximum level

● RV7/AU-13 (CH-1)

### «spec.»

- TP103/AU-13 (CH-2)
- Maximum level

● RV107/AU-13 (CH-2)

## 12-20. CROSSTALK CANCEL ADJUSTMENT (1)

### «machine conditions for adjustment»

- CH-1 INSERT mode
- Use the tape that is not recorded of the AUDIO signal.

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- Minimum level

● RV6/AU-13

## 12-21. CROSSTALK CANCEL ADJUSTMENT (2)

### «machine conditions for adjustment»

- CH-2 INSERT mode
- Use the tape that is not recorded of the AUDIO signal.

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- Minimum level

● RV106/AU-13

## 12-22. CH-1 INSERT OFF DELAY TIME ADJUSTMENT

### «machine conditions for adjustment»

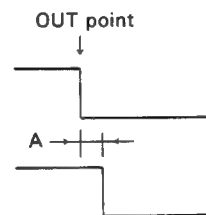
- Change the mode, CH-1 INSERT mode to ENTRY OUT mode.

### «spec.»

- TP201/AU-13

- TP202/AU-13

TRIG ; SINGLE TP201/AU-13 (-)



NOTE : Applicable parts number 1-604-337-11 to -15.

- $A = 120 \pm 10\text{ms}$

● RV202/AU-13

### Reference

When  $A < 120\text{ms}$  ; Turn the RV202 clockwise.  
(adjust from soldering side)

When  $A > 120\text{ms}$  ; Turn the RV202 counterclockwise.  
(adjust from soldering side)

NOTE : Applicable parts number 1-604-337-16 and later.

- $A = 80 \pm 10\text{ms}$

● RV202/AU-13

### Reference

When  $A < 80\text{ms}$  ; Turn the RV202 clockwise.  
(adjust from soldering side)

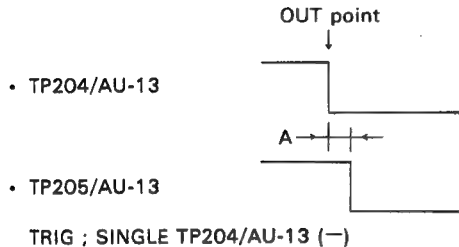
When  $A > 80\text{ms}$  ; Turn the RV202 counterclockwise.  
(adjust from soldering side)

## 12-23. CH-2 INSERT OFF DELAY TIME ADJUSTMENT

### «machine conditions for adjustment»

- Change the mode, CH-2 INSERT mode to ENTRY OUT mode.

### «spec.»



NOTE ; Applicable parts number 1-604-337-11 to -15.

- $A = 120 \pm 10\text{mS}$

RV204/AU-13

### Reference

When  $A < 120\text{mS}$  ; Turn the RV204 clockwise.

(adjust from soldering side)

When  $A > 120\text{mS}$  ; Turn the RV204 counterclockwise.

(adjust from soldering side)

NOTE ; Applicable parts number 1-604-337-16 and later.

- $A = 80 \pm 10\text{mS}$

RV204/AU-13

### Reference

When  $A < 80\text{mS}$  ; Turn the RV204 clockwise.

(adjust from soldering side)

When  $A > 80\text{mS}$  ; Turn the RV204 counterclockwise.

(adjust from soldering side)

## 12-24. CH-1 BIAS ON DELAY TIME ADJUSTMENT

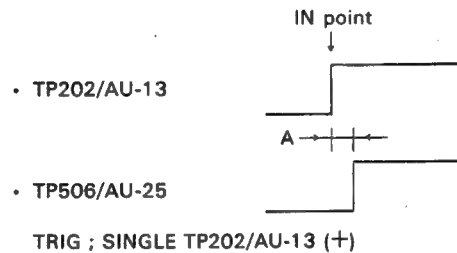
NOTE ; Applicable parts number 1-604-337-11 to -15.

NOTE ; This adjustment is not necessary for parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, STOP mode to CH-1 INSERT mode.

### «spec.»



- $A = 100 \pm 10\text{mS}$

RV203/AU-13

### Reference

When  $A < 100\text{mS}$  ; Turn the RV203 clockwise.

(adjust from soldering side)

When  $A > 100\text{mS}$  ; Turn the RV203 counterclockwise.

(adjust from soldering side)

## 12-25. CH-2 BIAS ON DELAY TIME ADJUSTMENT

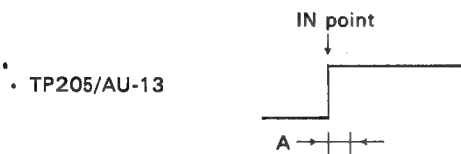
NOTE ; Applicable parts number 1-604-337-11 to -15.

NOTE ; This adjustment is not necessary for parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, STOP mode to CH-2 INSERT mode.

### «spec.»



• TP205/AU-13

• TP507/AU-25

TRIG ; SINGLE TP205/AU-13 (+)

•  $A = 100 \pm 10\text{mS}$

● RV205/AU-13

### Reference

- When  $A < 100\text{mS}$  ; Turn the RV205 clockwise.  
(adjust from soldering side)
- When  $A > 100\text{mS}$  ; Turn the RV205 counterclockwise.  
(adjust from soldering side)

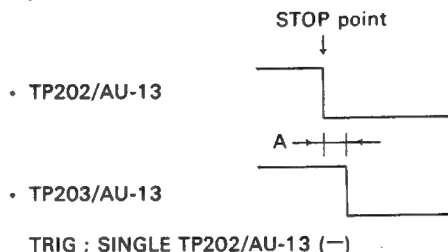
## 12-26. CH-1 REC OFF DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, CH-1 REC mode to STOP mode.

### «spec.»



• TP202/AU-13

• TP203/AU-13

TRIG ; SINGLE TP202/AU-13 (-)

•  $A = 50 + 5\text{mS}$   
- 0mS

● RV208/AU-13

### Reference

- When  $A < 50\text{mS}$  ; Turn the RV208 clockwise.  
(adjust from soldering side)
- When  $A > 50\text{mS}$  ; Turn the RV208 counterclockwise.  
(adjust from soldering side)

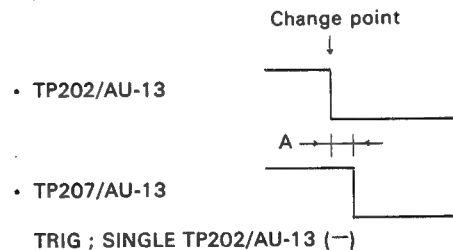
## 12-27. CH-1 REC/EE OFF DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- STOP mode
- PB/PB • EE SW ; Change the switch PB • EE to PB position.

### «spec.»



• TP202/AU-13

• TP207/AU-13

TRIG ; SINGLE TP202/AU-13 (-)

•  $A = 60 + 5\text{mS}$   
- 0mS

● RV206/AU-13

### Reference

- When  $A < 60\text{mS}$  ; Turn the RV206 clockwise.  
(adjust from soldering side)
- When  $A > 60\text{mS}$  ; Turn the RV206 counterclockwise.  
(adjust from soldering side)

## 12-28. CH-2 REC OFF DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, CH-2 REC mode to STOP mode.

### «spec.»

- TP205/AU-13

- TP206/AU-13

TRIG ; SINGLE TP205/AU-13 (—)

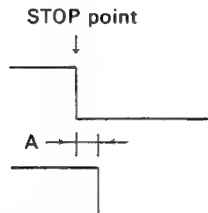
- $A = 50 \pm 5\text{mS}$   
— 0mS

- RV209/AU-13

### Reference

When  $A < 50\text{mS}$  ; Turn the RV209 clockwise.  
(adjust from soldering side)

When  $A > 50\text{mS}$  ; Turn the RV209 counterclockwise.  
(adjust from soldering side)



## 12-29. CH-2 REC/EE OFF DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- STOP mode
- PB/PB• EE SW ; Change the switch PB• EE to PB position.

### «spec.»

- TP205/AU-13

- TP208/AU-13

TRIG ; SINGLE TP205/AU-13 (—)

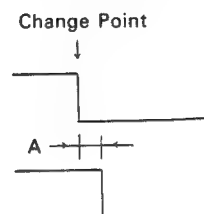
- $A = 60 \pm 5\text{mS}$   
— 0mS

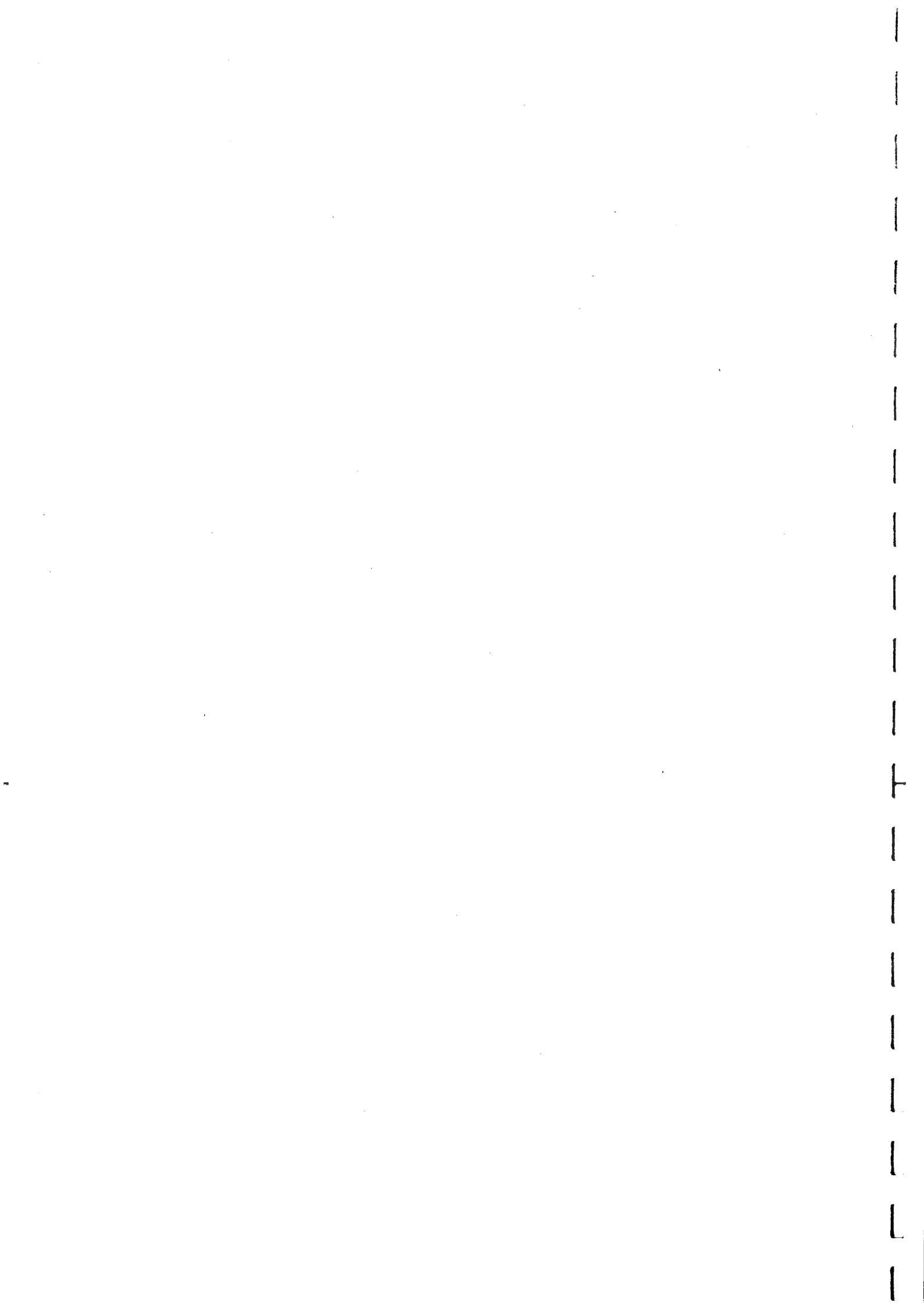
- RV207/AU-13

### Reference

When  $A < 60\text{mS}$  ; Turn the RV207 clockwise.  
(adjust from soldering side)

When  $A > 60\text{mS}$  ; Turn the RV207 counterclockwise.  
(adjust from soldering side)







## SECTION 13 VIDEO SYSTEM ALIGNMENT

VIDEO

### [Equipment Required]

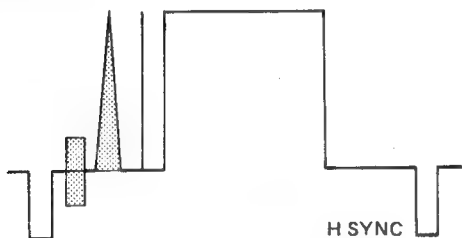
- Oscilloscope
- Frequency Counter
- Blank Tape
- Alignment Tape
- RR5-4SB (Parts No. 8-960-015-16)

Time (min.)	Video	Audio	Time code
4	Monoscope	3kHz, 0dB	—
5	Color bars	—	1.2kHz
5	R-F sweep	—	—
2	Modulated 20T pulse	1kHz, 0dB	—
2	Monoscope with burst	10kHz, -10dB	—
2	Pseudo C.B. for DOC adj	—	—

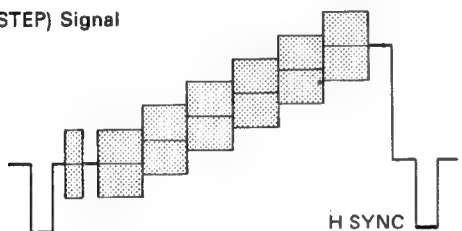
- Video Signal Generator
- Video Sweep Generator

### [Video Signal Required]

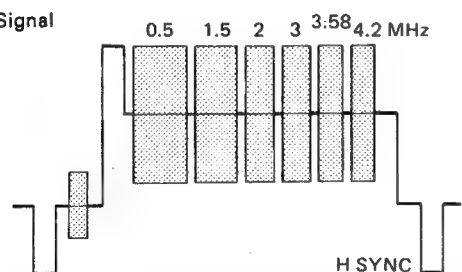
- 75% color bar signal
- B/W Video Signal
- Modulated 20T pulse signal



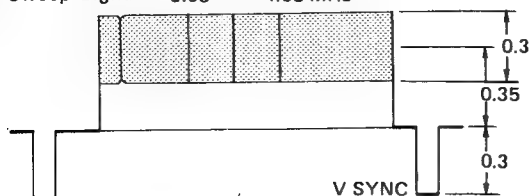
- Linearity (5 STEP) Signal



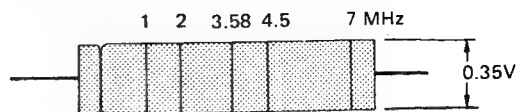
- Multi Burst Signal



- Gated Sweep Signal



- Sweep Signal



### [Switch/VR Setting]

- \* Front Panel
  - AUDIO MONITOR ..... MIX
  - HEADPHONES LEVEL ..... MID
  - TRACKING ..... FIXED
  - VIDEO ..... AUTO
  - AUDIO LIMITER ..... OFF
  - MIXING SELECT ..... OFF
  - MODE SELECT ..... NORMAL
  - INPUT SELECT ..... LINE
  - SKEW ..... CLICK
  - REMOTE 1/2 ..... 2 (36P)
  - REMOTE/LOCAL ..... LOCAL
  - DT SELECT ..... OFF
  - PB/PB-EE ..... PB-EE
- \* Rear Panel
  - FRAMING SERVO ..... ON
  - VIDEO IN ..... ON
  - SERVO LOCK ..... AUTO

## 13-1. PLAYBACK AMPLIFIER ADJUSTMENT

### 13-1-1. RF Frequency Response Adjustment (High Frequency Range)

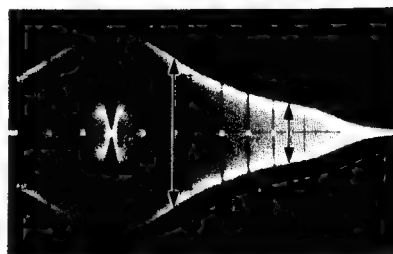
#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)
- Short between TP2 and GND/SV board with jumper.
- Turn RV2/YD board (CH-A) fully clockwise. (adjust from the soldering side)
- Turn RV1/YD board (CH-B) fully clockwise. (adjust from the soldering side)

#### «spec.»

- TP6/YD board

2 MHz 6 MHz



TRIG ; TP3/YD board

2MHz	6MHz
100% reference	30 ± 5%

- RV4/RP board (CH-A)
- RV6/RP board (CH-B)

NOTE ; After completing this adjustment, perform the section 13-1-2. RF Frequency Response Adjustment (Middle Frequency Range).

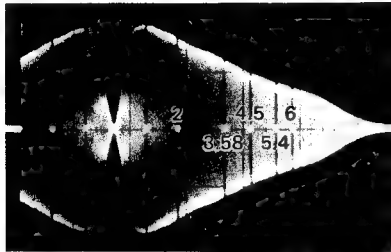
### 13-1-2. RF Frequency Response Adjustment (Middle Frequency Range)

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)
- Short between TP2 and GND/SV board with jumper.
- Short between TP31 and GND/DT board with jumper.
- Short between TP32 and GND/DT board with jumper.

#### «spec.»

- TP6/YD board



TRIG ; TP3/YD board

2MHz	3.58MHz	4.5MHz	5.4MHz	6MHz
100% reference	68 ± 10%	56 ± 10%	46 ± 10%	41 ± 10%

⊗RV2/YD board (CH-A)

⊗RV1/YD board (CH-B)

Change the DT SW, OFF position to VAR position.

- Equalize the waveforms, at OFF position's waveform and VAR position's waveform.

⊗RV9/RP board (CH-A)

⊗RV10/RP board (CH-B)

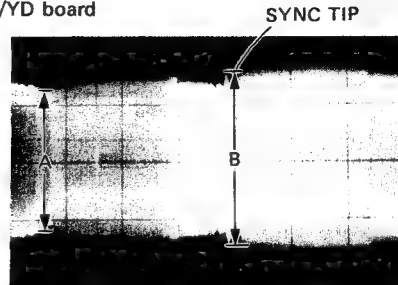
### 13-1-3. Y-RF Balance/Level Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

#### «spec.»

- TP6/YD board



TRIG ; TP3/YD board

- $A = B$

⊗RV4/YD board (balance)

- $A = 0.78 \pm 0.04V$  (SYNC TIP portion)

⊗RV5/YD board (level)

Change the DT SW, OFF position to VAR position.

- $A = B = 0.65 \pm 0.04V$  (SYNC TIP portion)

⊗RV7/RP board (CH-A)

⊗RV8/RP board (CH-B)

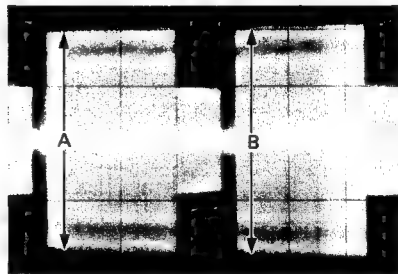
### 13-1-4. Chroma RF Balance/Level Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

#### «spec.»

- TP34/CD board



TRIG ; TP3/YD board

- $A = B$

⊗RV3/YD board (balance)

- $A = 0.2 \pm 0.01V$

⊗RV7/YD board (level)

Change the DT SW, OFF position to VAR position.

- $A = B$

⊗RV20/YD board (balance)

- $A = 0.2 \pm 0.01V$

⊗RV21/YD board (level)

### 13-1-5. Audio Bias Trap Adjustment

#### «machine conditions for adjustment»

- Install the recorded tape that the CTL signal is only pre-recorded (video signal is not recorded), and put the AUDIO CH-1 INSERT mode.

#### «spec.»

- TP7/YD board
- Minimize the level.

● LV1/YD board

## 13-2. Y DEMODURATOR ADJUSTMENT

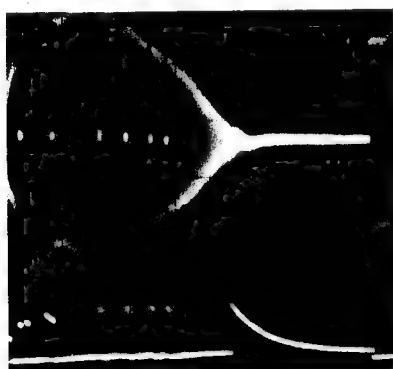
### 13-2-1. Dropout Compensator Sensitivity Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)

#### «spec.»

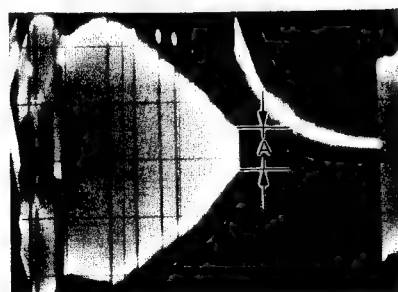
- TP31/YD board



- TP25/YD board



- Oscilloscope ADD mode



TRIG ; TP3/YD board

- Turn in fully counterclockwise first, and then turn slowly in clockwise to meets the specification.  
(adjust from the component side)
- $A = 0.032V$

● RV8/YD board

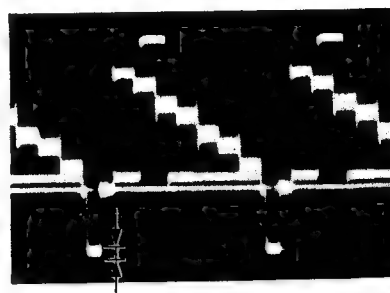
### 13-2-2. Carrier Balance Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- Short between TP7 and GND/YD board with jumper.

#### «spec.»

- TP14/YD board



- Minimize the noise level at SYNC portion.

● RV18/YD board

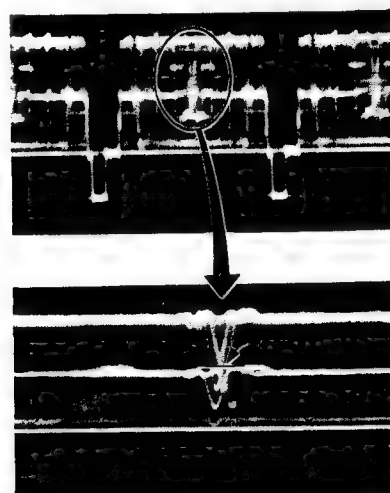
### 13-2-3. COLOR Mode Y Phase Equalizer Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (monoscope with burst segment)

#### «spec.»

- TP18/YD board



- Equalize the waveform ringing of both side.

● RV19/YD board

### 13-2-4. V BLK Pulse Width Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

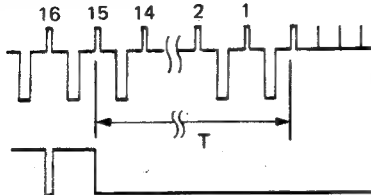
«spec.»

- TP27/YD board

- TP26/YD board

- $T = 15H$

- RV16/YD board



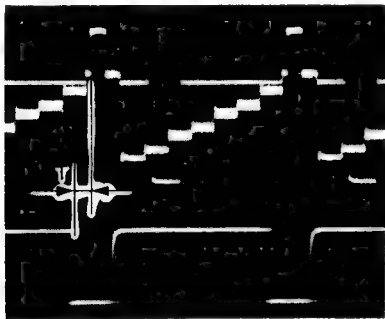
### 13-2-5. H BLK Pulse Width Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP27/YD board



- TP26/YD board

- $T = 6 \pm 1\mu S$

- RV17/YD board

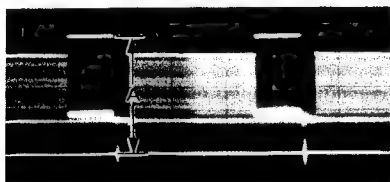
### 13-2-6. B/W Mode Y Output Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- Short between TP7 and GND/YD board with jumper.

«spec.»

- VIDEO OUT (75Ω terminated)



- $A = 1 \pm 0.05V$

- RV10/YD board

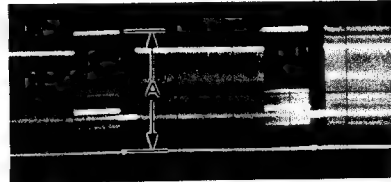
### 13-2-7. COLOR Mode Y Output Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- VIDEO OUT (75Ω terminated)



- $A = 1 \pm 0.05V$

- RV11/YD board

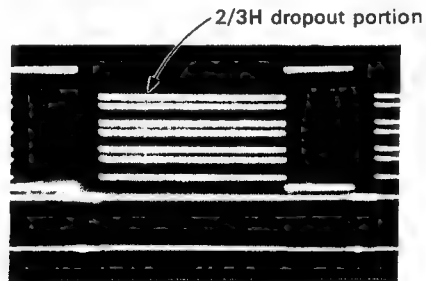
### 13-2-8. Dropout Compensator Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (pseudo color bar for DOC adj. segment)

«spec.»

- TP18/YD board



- Equalize the SYNC levels at dropout compensated portion and non dropout portion.

- RV12/YD board

- Equalize the white levels at dropout compensated portion and non dropout portion.

- RV15/YD board

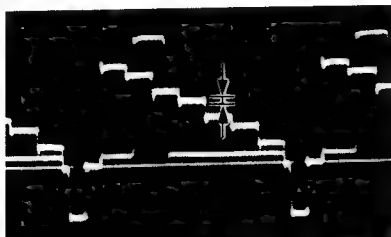
### 13-2-9. Secondary Beat Cancel Circuit Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP18/YD board



- Minimize the secondary beat.

- RV13/YD board

## 13-3. CHROMA DEMODULATOR ADJUSTMENT

### 13-3-1. REF OSC Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP26/CD board
- $3,579,545 \pm 5\text{Hz}$

- T1/CD board

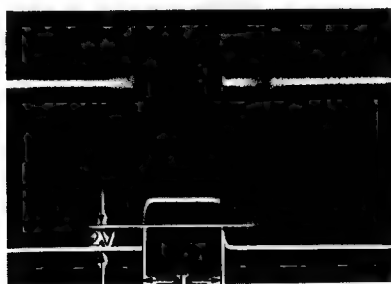
### 13-3-2. ACC Burst Flag Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP16/CD board



- TP27/CD board

- $T = 2.8 \pm 0.1\mu\text{S}$

- RV206/CD board (width)

- Phase the center positions of the burst and the burst flag pulse.

- RV207/CD board (phase)

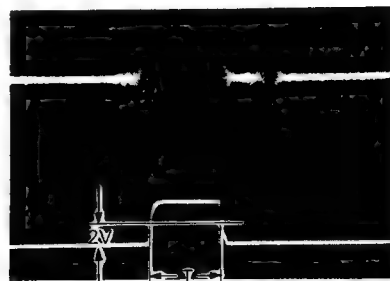
### 13-3-3. APC Burst Flag Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP16/CD board



- TP9/CD board

- $T = 2.5 \pm 0.1\mu\text{S}$

- RV203/CD board (width)

- Phase the center positions of the burst and the burst flag pulse.

- RV204/CD board (phase)

### 13-3-4. DT ACC Burst Flag Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SW ; VAR

«spec.»

- TP16/CD board



- TP37/CD board

- $T = 1.4 \pm 0.05\mu\text{S}$

- RV402/CD board (width)

- Phase the center positions of the burst and the burst flag pulse.

- RV401/CD board (phase)

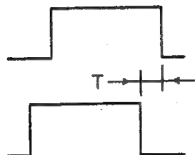
### 13-3-5. DT Blanking Pulse Adjustment

«machine conditions for adjustment»

- REC mode
- VIDEO IN ; color bar
- PB/PB • EE SW ; PB • EE

«spec.»

- TP12/CD board



- 35A/CD board

- $T = 0 \pm 10\mu S$

- RV404/CD board

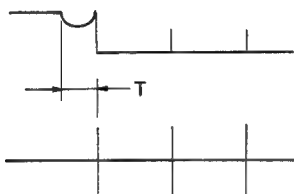
### 13-3-6. DT ACC Blanking Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SW ; VAR

«spec.»

- TP38/CD board



- TP16/CD board

- $T = 10 \pm 2\mu S$

- RV403/CD board

### 13-3-7. VCO Frequency Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP8/CD board
- $8.1 \pm 0.05V$

- RV6/CD board

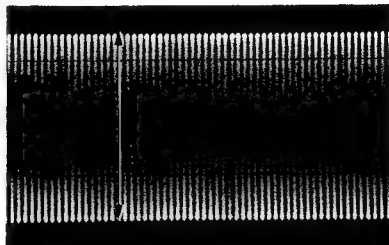
### 13-3-8. PB4.27MHz Tuning Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP18/CD board



- Maximize the level ( $0.8 \pm 0.1V$ )

- LV2, T2/CD board

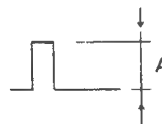
### 13-3-9. APC Gain Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP9/CD board



- $A = 3.8 \pm 0.1V$

- RV215/CD board

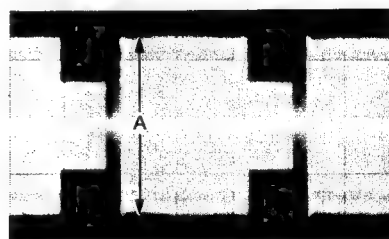
### 13-3-10. ACC Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP16/CD board



TRIG ; TP13/CD board

- $A = 0.8 \pm 0.05V$

- RV3/CD board

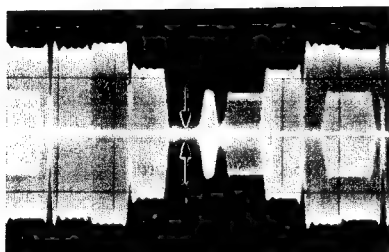
### 13-3-11. Converter Balance Adjustment

#### «machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

#### «spec.»

- TP16/CD board



TRIG ; TP9/CD board

- Minimize the carrier leak.

- RV4/CD board

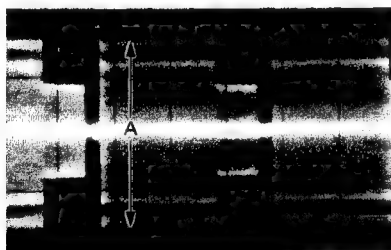
### 13-3-12. DUB Chroma Level Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

#### «spec.»

- TP10/CD board



TRIG ; TP13/CD board

- $A = 0.9 \pm 0.1V$

- RV5/CD board

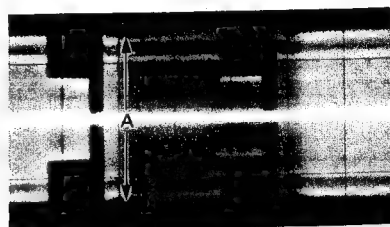
### 13-3-13. High Speed ACC Level Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- Turn the RV201/CD board fully clockwise.  
(adjust from the soldering side)

#### «spec.»

- TP32/CD board



TRIG ; TP13/CD board

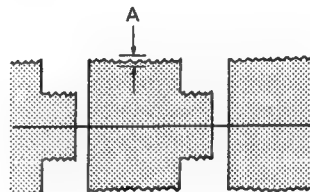
- $A = 0.75 \pm 0.05V$

- RV202/CD board

NOTE ; Turn fully clockwise first, and then turn slowly in counterclockwise to meets the specification.  
(adjust from the component side)

Change the DT SW, OFF position to VAR position.

- TP32/CD board



TRIG : TP13/CD board

- Minimize the A amplitude.

- RV201/CD board

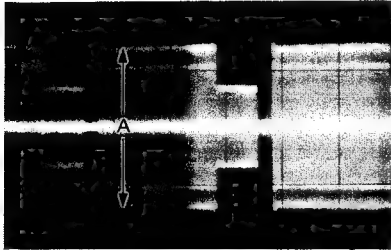
### 13-3-14. 1H Delay Chroma Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP29/CD board



TRIG ; TP13/CD board

- A = TP29 level = TP32 level

- RV209/CD board

NOTE ; After completing this adjustment, perform the section 13-3-19. 1H Delay DOC Level Adjustment.

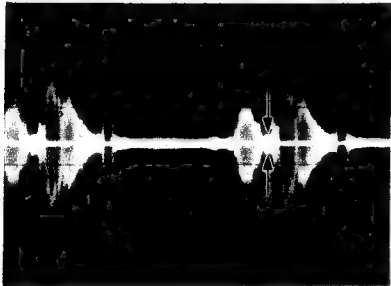
### 13-3-15. Color Comb Filter Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; Multi Burst (with burst)

«spec.»

- TP30/CD board



TRIG ; TP9/CD board

- Minimize the level at 3.58MHz portion.

- RV210, LV3/CD board

NOTE ; Repeat the adjustments section 13-3-14. and section 13-3-15. until spec are met.

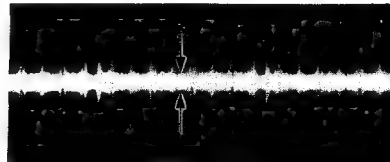
### 13-3-16. Chroma Reject Circuit Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP31/CD board



TRIG ; TP9/CD board

- Minimize the chroma noise.

- RV211/CD board

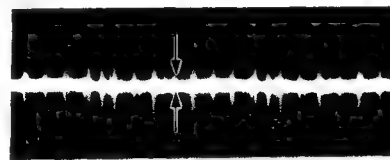
### 13-3-17. Chroma Noise Canceller Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP28/CD board



TRIG ; TP9/CD board

- Minimize the chroma noise.

- RV212/CD board

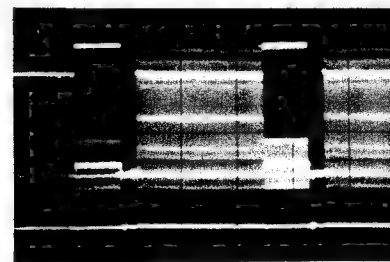
### 13-3-18. Y/C Mix Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- MODE SELECT SW ; Change the switch TBC to NORMAL position.

«spec.»

- TP19/CD board



- Adjust the chroma level to Y 100% level.

- RV7/CD board (at TBC)

- RV216/CD board (at NORMAL)

- The level should not be varied whenever changing the MODE SELECT switch.



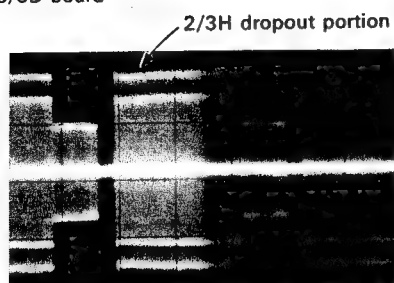
### 13-3-19. 1H Delay DOC Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (pseudo color bar for DOC adj. segment)

«spec.»

- TP25/CD board



TRIG ; TP13/CD board

- Equalize the chroma levels at 2/3H dropout compensated portion and non dropout portion.

RV209/CD board

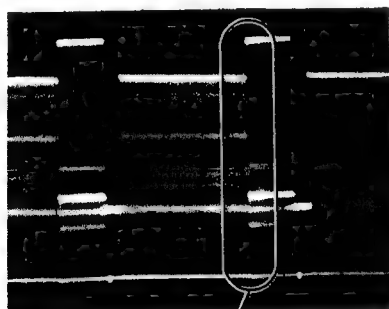
### 13-3-20. 1H Delay Compensator Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP19/CD board



- Minimize the 1H delay error.

RV213/CD board

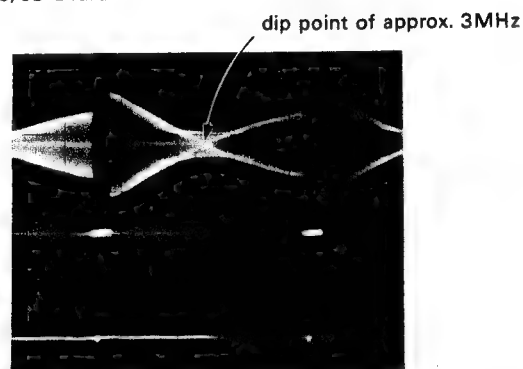
### 13-3-21. Noise Canceller Adjustment

«machine conditions for adjustment»

- Remove YD board from the set.
- Short between 3A and 34A/CD board with jumper.
- Feed a 50mVp-p gated sweep signal to TP20/CD board.
- Turn the S1/CD board to ON.

«spec.»

- TP19/CD board



- Minimize the dip point level.

RV8/CD board

NOTE ; After completing this adjustment, insert the YD board to the set.

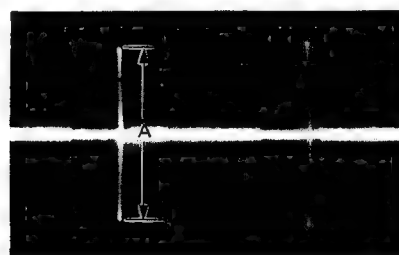
### 13-3-22. Time Code Detector Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (time code segment)

«spec.»

- TP1/CD board



- $A = 2.8 \pm 0.1V$

RV1/CD board

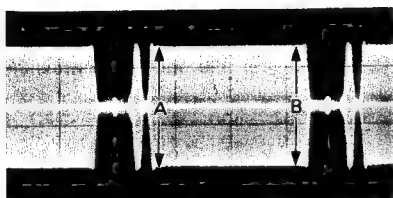
### 13-3-23. DG Compensator Adjustment

«machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; Linearity (5 STEP) signal (with sub-carrier and burst)

«spec.»

- TP16/CD board



TRIG ; TP9/CD board

- $A = B$

- RV208/CD board

## 13-4. MODULATOR ADJUSTMENT

### 13-4-1. Sync Tip Carrier Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; no signal

«spec.»

- TP8/MD board
- $3.8 \pm 0.05\text{MHz}$

- RV7/MD board

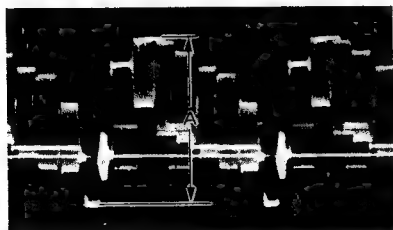
### 13-4-2. FM Deviation Adjustment

«machine conditions for adjustment»

- EE mode.
- VIDEO IN ; color bar

«spec.»

- VIDEO OUT (75 $\Omega$  terminated)



- $A = 1 \pm 0.05\text{V}$

- RV4/MD board

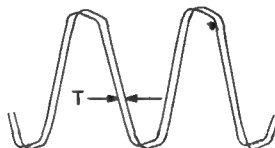
### 13-4-3. Modulator Balance Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; no signal

«spec.»

- TP8/MD board ; Scope CH-A
- TP8/MD board (INVERT) ; Scope CH-B
- Oscilloscope ; ALT mode



- $T = 0$

- RV6/MD board

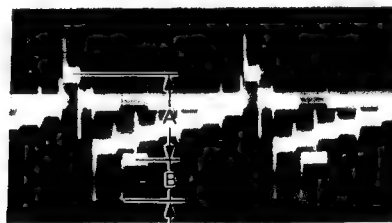
### 13-4-4. White Clip Adjustment

«machine conditions for adjustment»

- EE mode.
- VIDEO IN ; color bar

«spec.»

- TP7/MD board



TRIG ; TP11/MD board

$$\frac{B}{A} = \frac{50 \pm 5}{100}$$

- RV5/MD board

### 13-4-5. SC Trap Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- Connect between Q202 emitter and IC2-PIN 1/MD board with 0.047 $\mu$ F capacitor.

«spec.»

- TP7/MD board



TRIG ; TP11/MD board

- Minimize the A amplitude. (3.58MHz)

- LV1/MD board

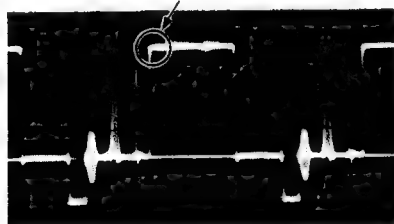
### 13-4-6. Smear Compensator Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; modulated 20T pulse

«spec.»

- VIDEO OUT



- Be almost right angle.

- RV15/MD board

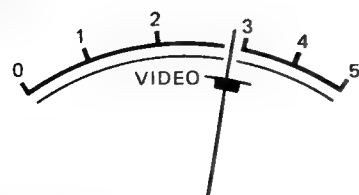
### 13-4-7. Video Meter Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- VIDEO SW ; AUTO

«spec.»

- VIDEO/RF meter



- Set the indication in the center of blue scale.

- RV14/MD board

### 13-4-8. 4.27MHz Oscillator Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP19/MD board
- 4,267,934  $\pm$  5Hz

- CV1/MD board

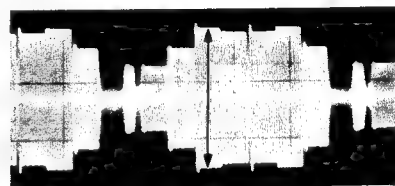
### 13-4-9. REC ACC Burst Tuning Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- 13A/MD board



TRIG ; TP11/MD board

- Minimize the Chroma Level.

- T2/MD board

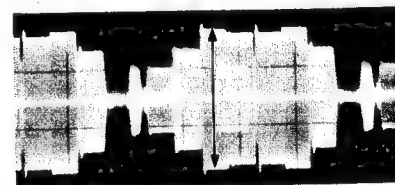
### 13-4-10. REC ACC Level Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- 13A/MD board



TRIG ; TP11/MD board

- Chroma Level = 0.9  $\pm$  0.02V

- RV8/MD board

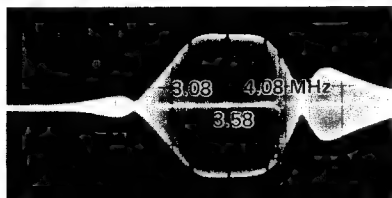
### 13-4-11. REC Chroma Frequency Response Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; gated sweep signal (with burst)

«spec.»

- 13A/MD board



TRIG ; 40B/MD board

3.58MHz	3.08MHz	4.08MHz
100% reference	90 ± 5%	90 ± 5%

- T1/MD board

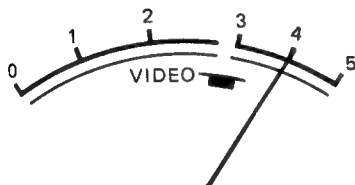
### 13-4-12. TRACKING METER Calibration

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- TRACKING ; FIXED

«spec.»

- VIDEO/RF meter



- Set the scale 4.

- RV13/MD board

### 13-5. RECORD AMPLIFIER ADJUSTMENT

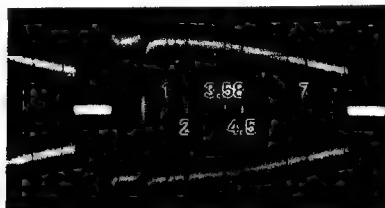
#### 13-5-1. Record Current Frequency Response Adjustment

«machine conditions for adjustment»

- REC mode
- VIDEO IN ; B/W signal
- Short between TP4 and E2/RP board with jumper.
- Unsolder between TP5 and TP6/RP board (CH-A), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Unsolder between TP8 and TP9/RP board (CH-B), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Short between TP6 and GND/RP board with jumper. (CH-A)
- Short between TP9 and GND/RP board with jumper. (CH-B)
- Feed a sweep signal to TP3/RP board.

«spec.»

- TP5/RP board (GND ; TP6) ..... CH-A



1MHz	2MHz	3.58MHz	4.5MHz	7MHz
100% reference	92 ± 10%	84 ± 10%	78 ± 10%	60 ± 5%

- RV3/RP board (CH-A)

«spec.»

- TP8/RP board (GND ; TP9) ..... CH-B

1MHz	2MHz	3.58MHz	4.5MHz	7MHz
100% reference	92 ± 10%	84 ± 10%	78 ± 10%	60 ± 5%

- RV5/RP board (CH-B)

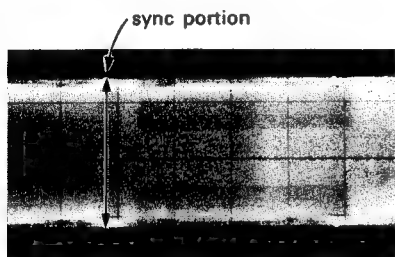
### 13-5-2. Y Record Current Adjustment

#### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; B/W signal
- Unsolder between TP5 and TP6/RP board (CH-A), and connect low resistor (1 to  $5.1\Omega$ ) to unsoldered portion.
- Unsolder between TP8 and TP9/RP board (CH-B), and connect low resistor (1 to  $5.1\Omega$ ) to unsoldered portion.
- Short between TP6 and GND/RP board with jumper. (CH-A)
- Short between TP9 and GND/RP board with jumper. (CH-B)

#### «spec.»

- TP5/RP board (GND ; TP6) or TP8/RP board (GND ; TP9)



- Sync Level =  $62 \pm 6\text{mA} \times R (\Omega)$   
(cf.  $R = 1\Omega$   $62 \pm 6\text{mV}$ )

●RV2/RP board

### 13-5-3. Chroma Record Current Adjustment

#### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; color bar
- Short between TP4 and E2/RP board with jumper.
- Unsolder between TP5 and TP6/RP board (CH-A), and connect low resistor (1 to  $5.1\Omega$ ) to unsoldered portion.
- Unsolder between TP8 and TP9/RP board (CH-B), and connect low resistor (1 to  $5.1\Omega$ ) to unsoldered portion.
- Short between TP6 and GND/RP board with jumper. (CH-A)
- Short between TP9 and GND/RP board with jumper. (CH-B)

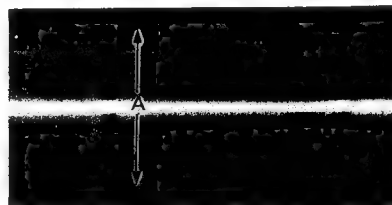
#### «machine conditions for adjustment»

- TP5/RP board (GND ; TP6) or TP8/RP board (GND ; TP9)
- Chroma Level =  $15 \pm 5\text{mA} \times R (\Omega)$   
(cf.  $R = 1\Omega$   $15 \pm 5\text{mV}$ )

●RV1/RP board

#### «spec.»

- Playback self-recorded portion. (After removing the short jumper of between TP4 and E2/RP board)
- TP34/CD board



- $A = 0.2 \pm 0.01\text{V}$

#### Reference

- Chroma Level  $> 0.2\text{V}$  ; Turn RV1 to clockwise.  
(adjust from soldering side)
- Chroma Level  $< 0.2\text{V}$  ; Turn RV1 to counterclockwise.  
(adjust from soldering side)

## 13-6. Y/C DELAY TIME ADJUSTMENT

### 13-6-1. PB Delay Time Adjustment

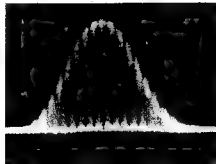
«machine conditions for adjustment»

- Playback mode ; Alignment tape (modulated 20T pulse segment)

«spec.»

- TP19/CD board

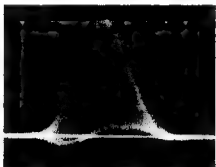
OK



Y progressed to C.



C progressed to Y.



DL201/CD board

### 13-6-2. DUB Delay Time Adjustment

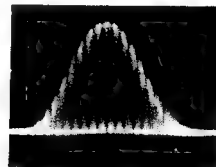
«machine conditions for adjustment»

- Playback mode ; Alignment tape (modulated 20T pulse segment)

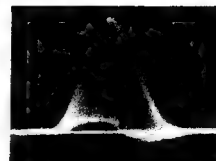
«spec.»

- DUB Y OUT (Scope CH-A)
- DUB C OUT (Scope CH-B)
- Oscilloscope ADD mode

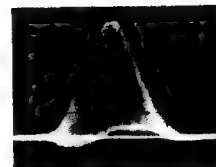
OK



Y progressed to C.



C progressed to Y.



DL1/CD board

### 13-6-3. Record Delay Time Adjustment

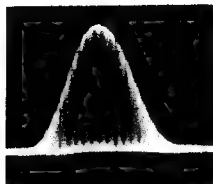
«machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; modulated 20T pulse

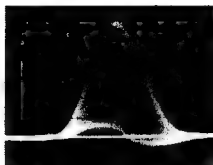
«spec.»

- VIDEO OUT

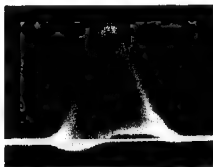
OK



Y progressed to C.



C progressed to Y.



DL1/MD board

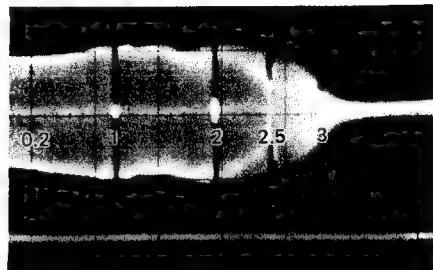
### 13-7. COLOR MODE OVERALL FREQUENCY RESPONSE ADJUSTMENT

«machine conditions for adjustment»

- Playback the self-recorded portion.
- VIDEO IN ; gated sweep (with burst)
- Connect between TP25 and GND/CD board with 0.1μF capacitor.

«spec.»

- VIDEO OUT



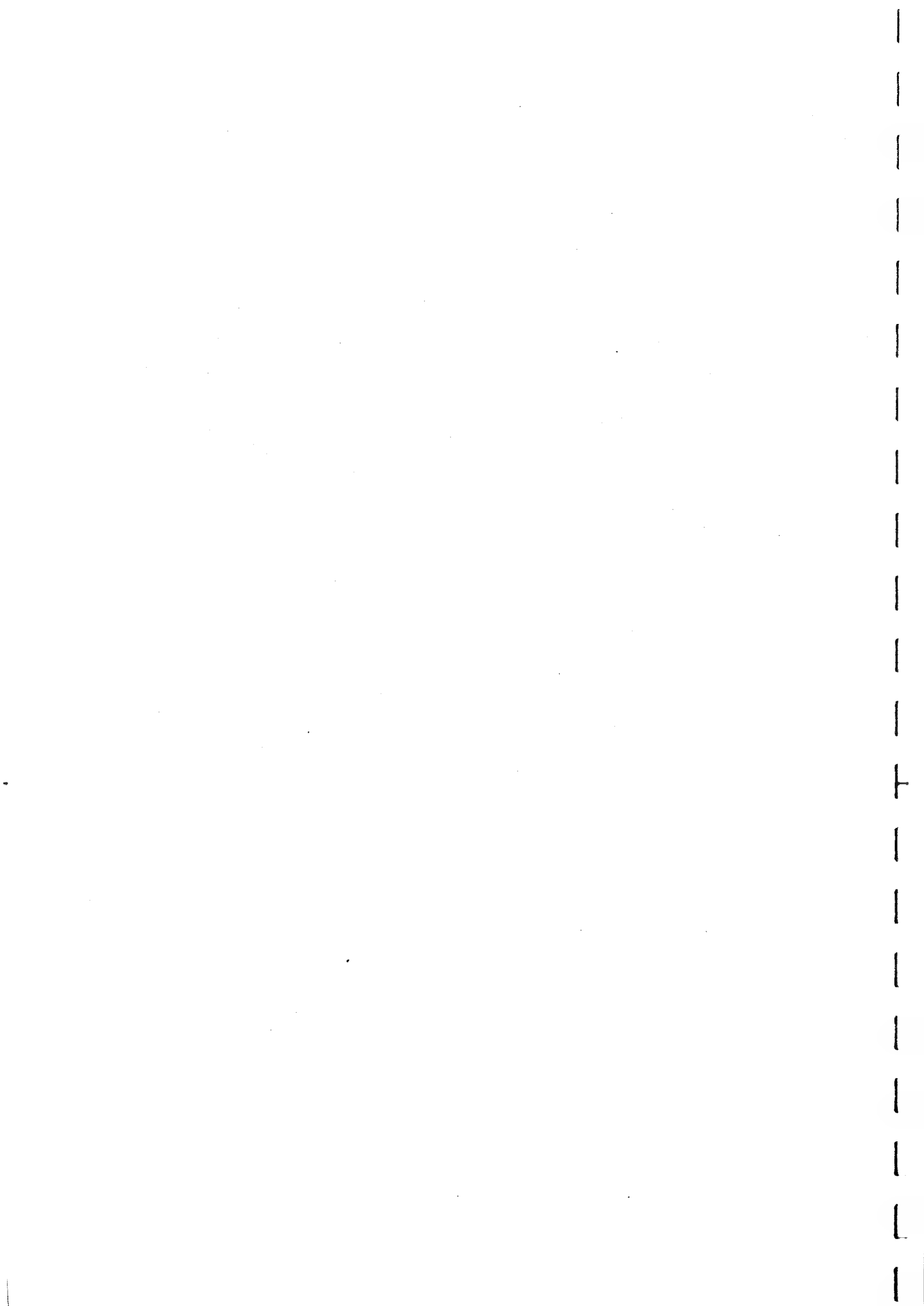
0.2MHz	1MHz	2MHz	2.5MHz	3MHz
100% reference	100 ± 10%	100 ± 10%	95 ± 15%	50 + 20 - 10%

- Adjust inside the specification of 13-5-2. Y Record Current Adj.

RV2/RP board (level) finely adjustment.

- Adjust inside the specification of 13-1-2. RF Frequency Response Adj.

RV2/YD board (CH-A) } (balance) finely adjustment.  
RV1/YD board (CH-B)





## SECTION 14

### EDITING SYSTEM ALIGNMENT

#### [Equipment Required]

- Oscilloscope
  - Audio Oscillator
  - Audio Attenuator
  - Blank Tape
  - Alignment Tape
- RR5-4SB (Parts No. 8-960-015-16)

Time (min.)	Video	Audio	Time code
4	Monoscope	3kHz, 0dB	—
5	Color bars	—	1.2kHz
5	R-F sweep	—	—
2	Modulated 20T pulse	1kHz, 0dB	—
2	Monoscope with burst	10kHz, -10dB	—
2	Pseudo C.B. for DOC adj	—	—

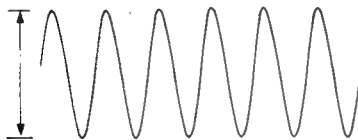
#### 14-1. ROTARY ERASE CURRENT ADJUSTMENT

##### «machine conditions for adjustment»

- VIDEO INSERT mode
- VIDEO IN ; color bar

##### «spec.»

- TP105/RP board (GND ; TP104/RP board) (CH-B)

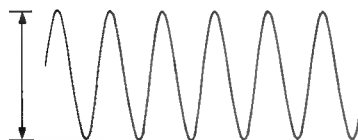


- $0.3 \pm 0.02V$

- RV101/RP board (CH-B)

##### «spec.»

- TP103/RP board (GND ; TP102/RP board) (CH-A)



- $0.3 \pm 0.02V$

- RV102/RP board (CH-A)

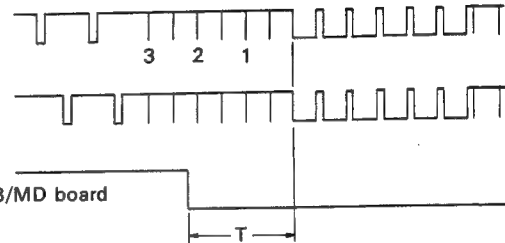
#### 14-2. CONF MODE SWITCHING PULSE ADJUSTMENT

##### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; color bar
- PB/PB • EE SW ; PB

##### «spec.»

- VIDEO OUT



- $T = 2.25 \pm 0.25H$

- RV504/MD board

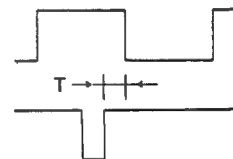
#### 14-3. RE GATE PULSE POSITION ADJUSTMENT

##### «machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- Short between 3B and 30B/MD board with jumper.

##### «spec.»

- 39B/MD board



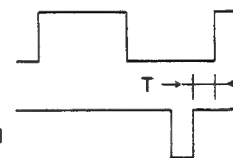
- TP504/MD board

- $T = 2.3 \pm 0.05mS$

- RV501/MD board (CH-A)

##### «spec.»

- 39B/MD board



- TP503/MD board

- $T = 2.3 \pm 0.05mS$

- RV502/MD board (CH-B)

#### 14-4. TIME CODE PLAYBACK/OUTPUT LEVEL ADJUSTMENT

NOTE ; Applicable parts number 1-604-341-11 to -14.

##### «machine conditions for adjustment»

- Playback mode ; Alignment tape (time code segment)

##### «spec.»

- TP104/TC-13



- $1.5 \pm 0.1V$

RV102/TC-13 (Playback Level)

##### «spec.»

- TC OUT
- $0 \pm 0.5dB$

RV103/TC-13 (Output Level)

#### 14-4. TIME CODE PLAYBACK AMPLIFIER ADJUSTMENT

##### 14-4-1. Playback Amplifier Offset Adjustment

NOTE ; Applicable parts number 1-604-341-15 and later.

##### «machine conditions for adjustment»

- STOP mode

##### «spec.»

- TP105/TC-13
- $0 \pm 0.2V$

RV103/TC-13

#### 14-4-2. Time code Output Level Adjustment

NOTE ; Applicable parts number 1-604-341-15 and later.

##### «machine conditions for adjustment»

- Playback mode ; Alignment tape (time code segment)

##### «spec.»

- TC OUT
- $0 \pm 0.5dB$

RV102/TC-13

Reference ; The level at TC OUT is  $0 \pm 2dB$ .

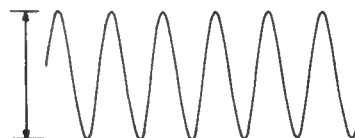
#### 14-5. TIME CODE RECORD CURRENT ADJUSTMENT

##### «machine conditions for adjustment»

- Playback the self-recorded portion.
- VIDEO IN ; color bar
- TC IN ; rectangular wave (sine wave), 1.2kHz, 0dB

##### «spec.»

- TP104/TC-13



- $1.9 \pm 0.1V$

RV101/TC-13

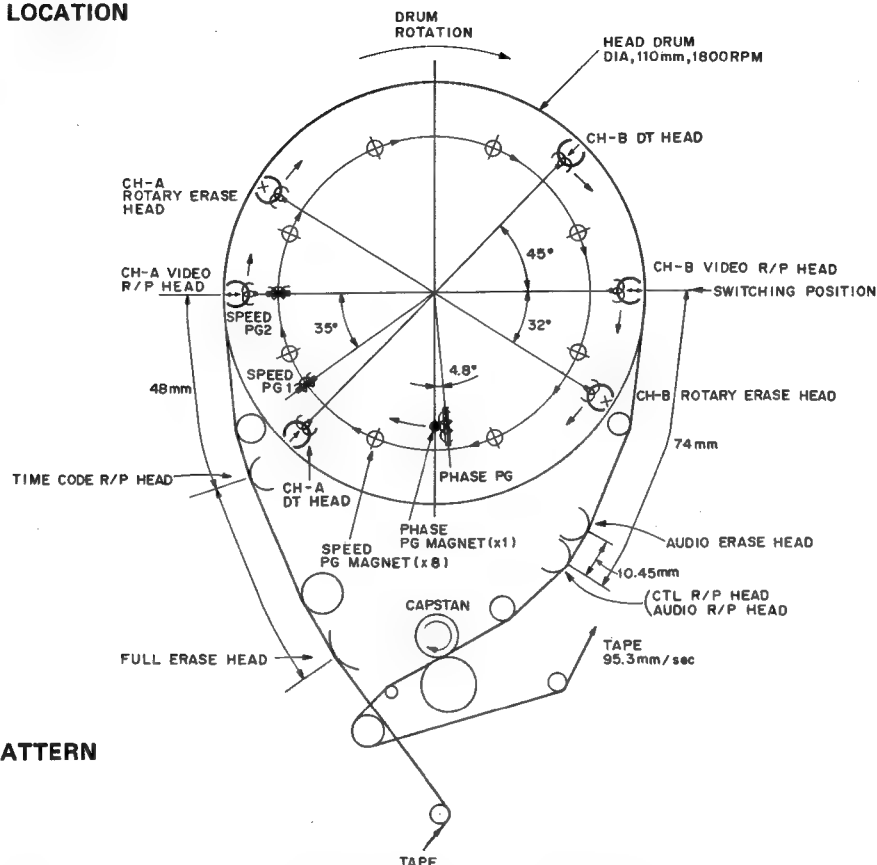
##### Reference

- Time code level  $< 1.9V$  ; Turn the RV101 to counterclockwise.  
(adjust from the component side)
- Time code level  $> 1.9V$  ; Turn the RV101 to clockwise.  
(adjust from the component side)

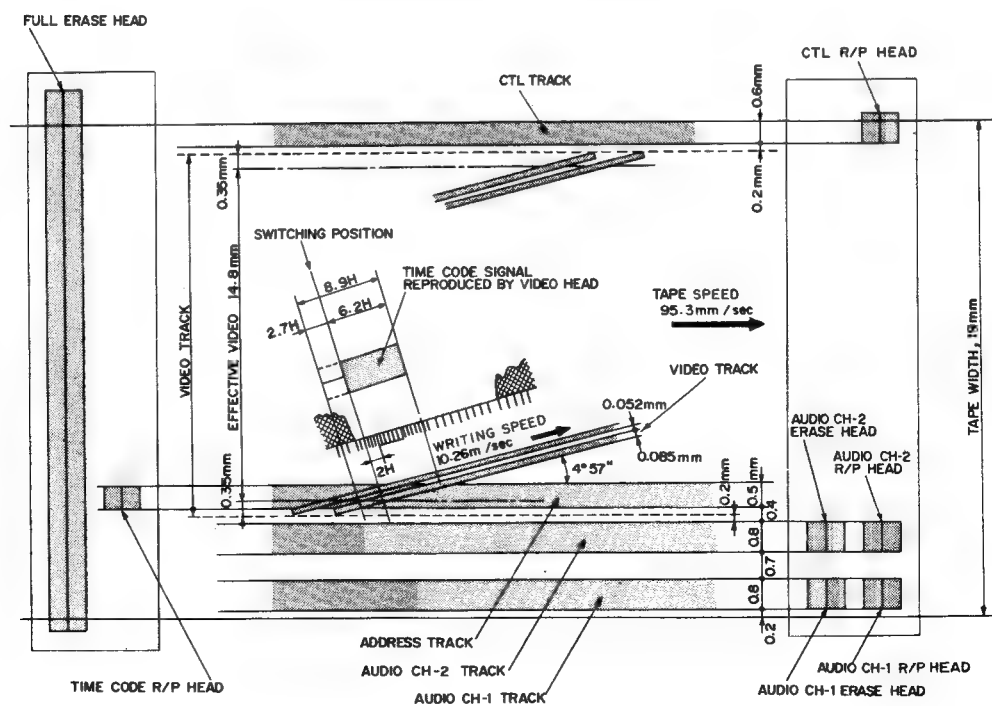
## SECTION 15 BLOCK DIAGRAM

### 15-1. TAPE FORMAT

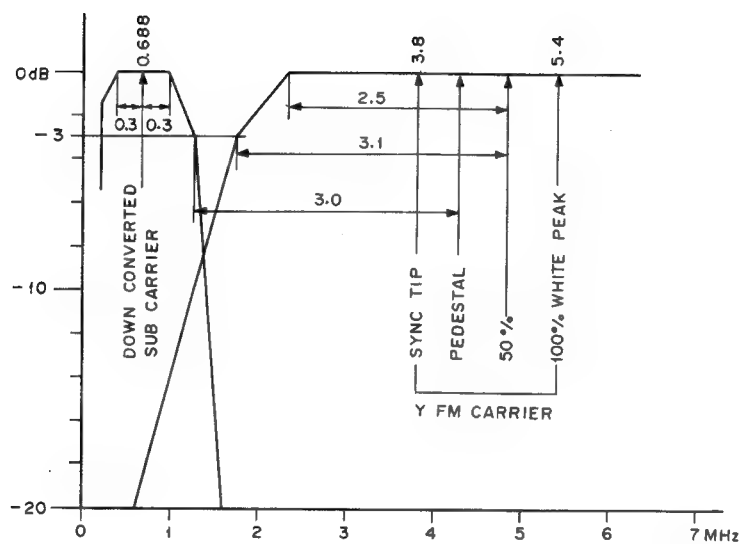
#### 15-1-1. HEADS LOCATION



#### 15-1-2. TAPE PATTERN

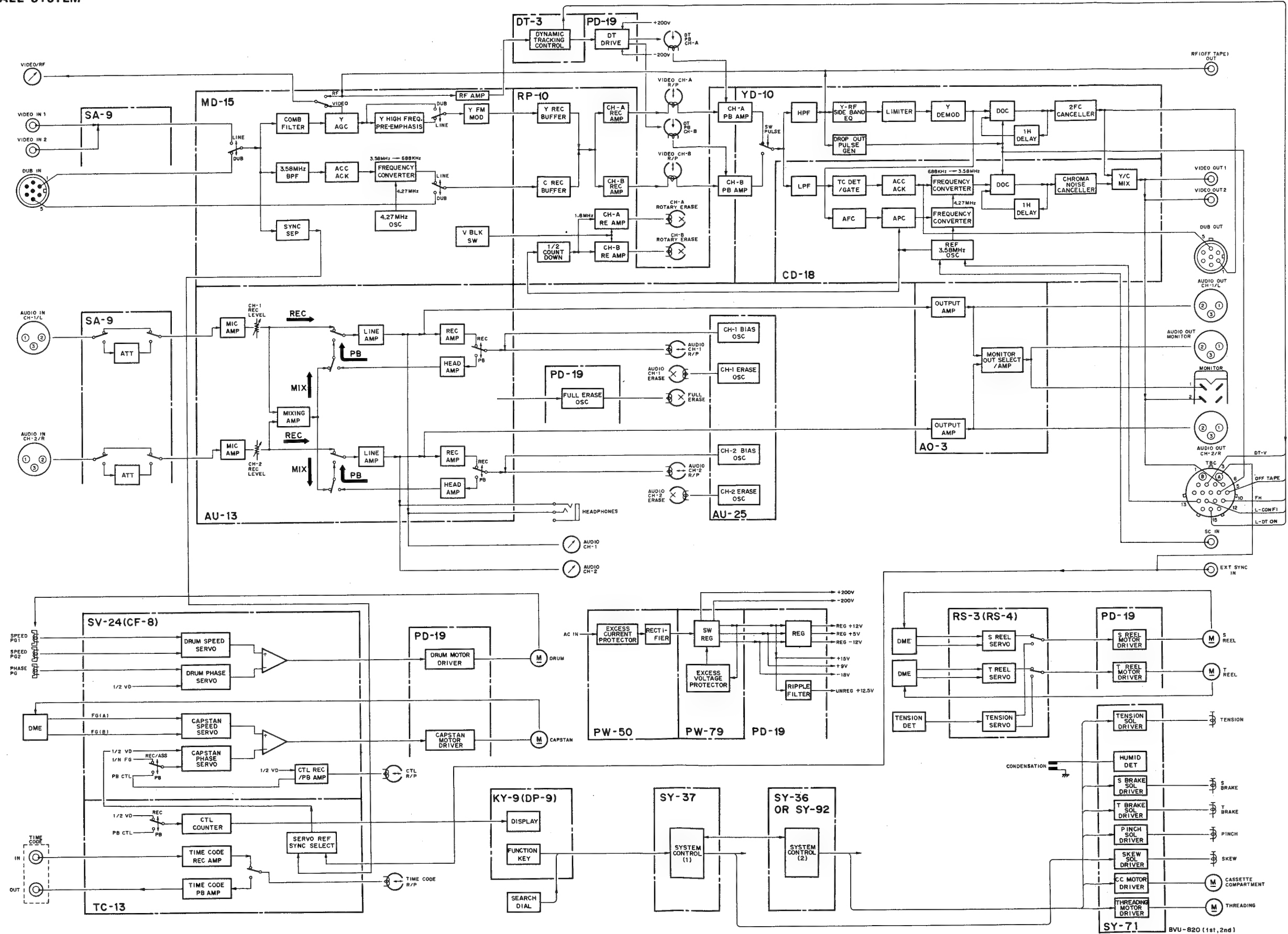


### BLOCK DIAGRAM



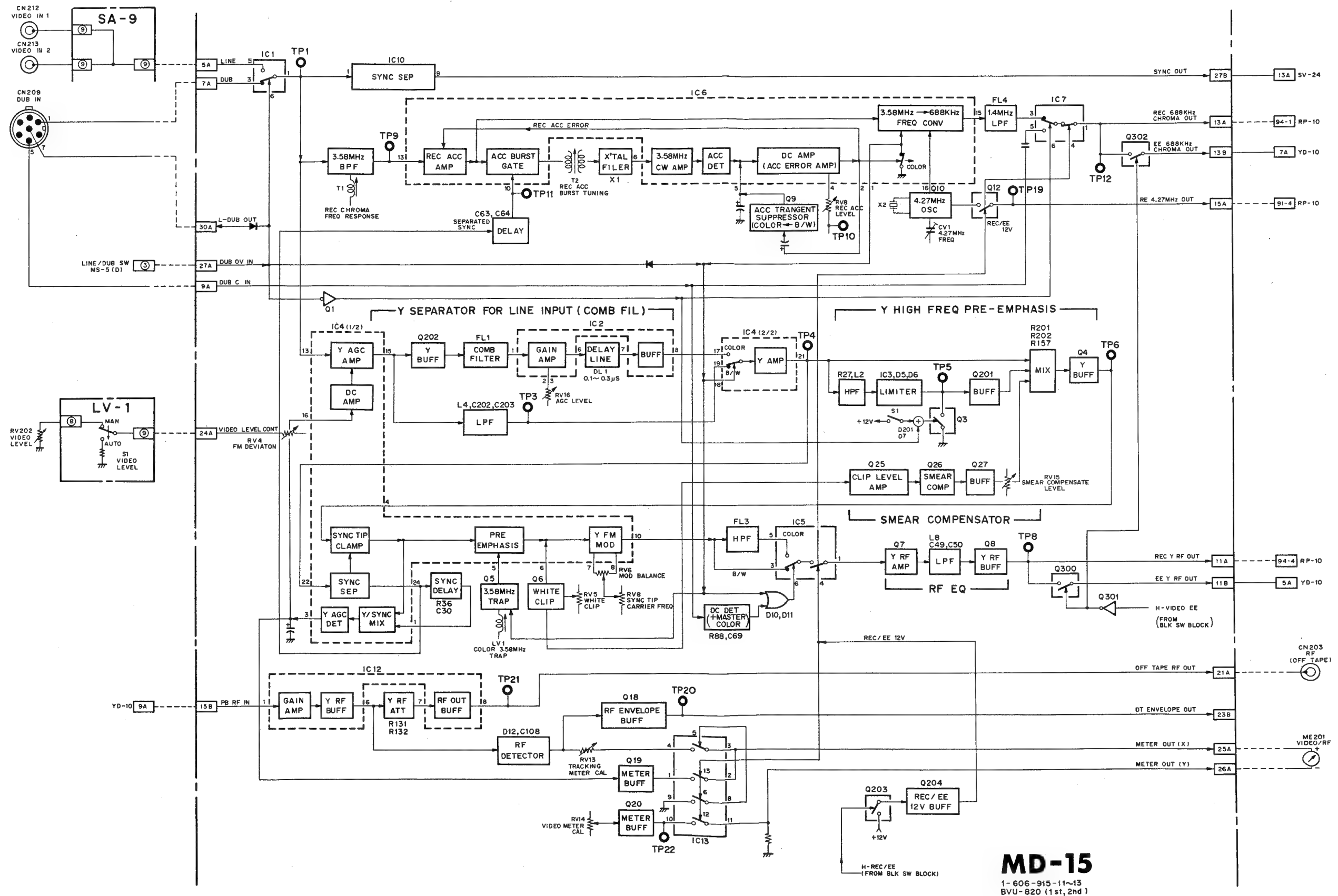
# OVERALL OVERALL

## OVERALL SYSTEM



# Y/C MOD Y/C MOD

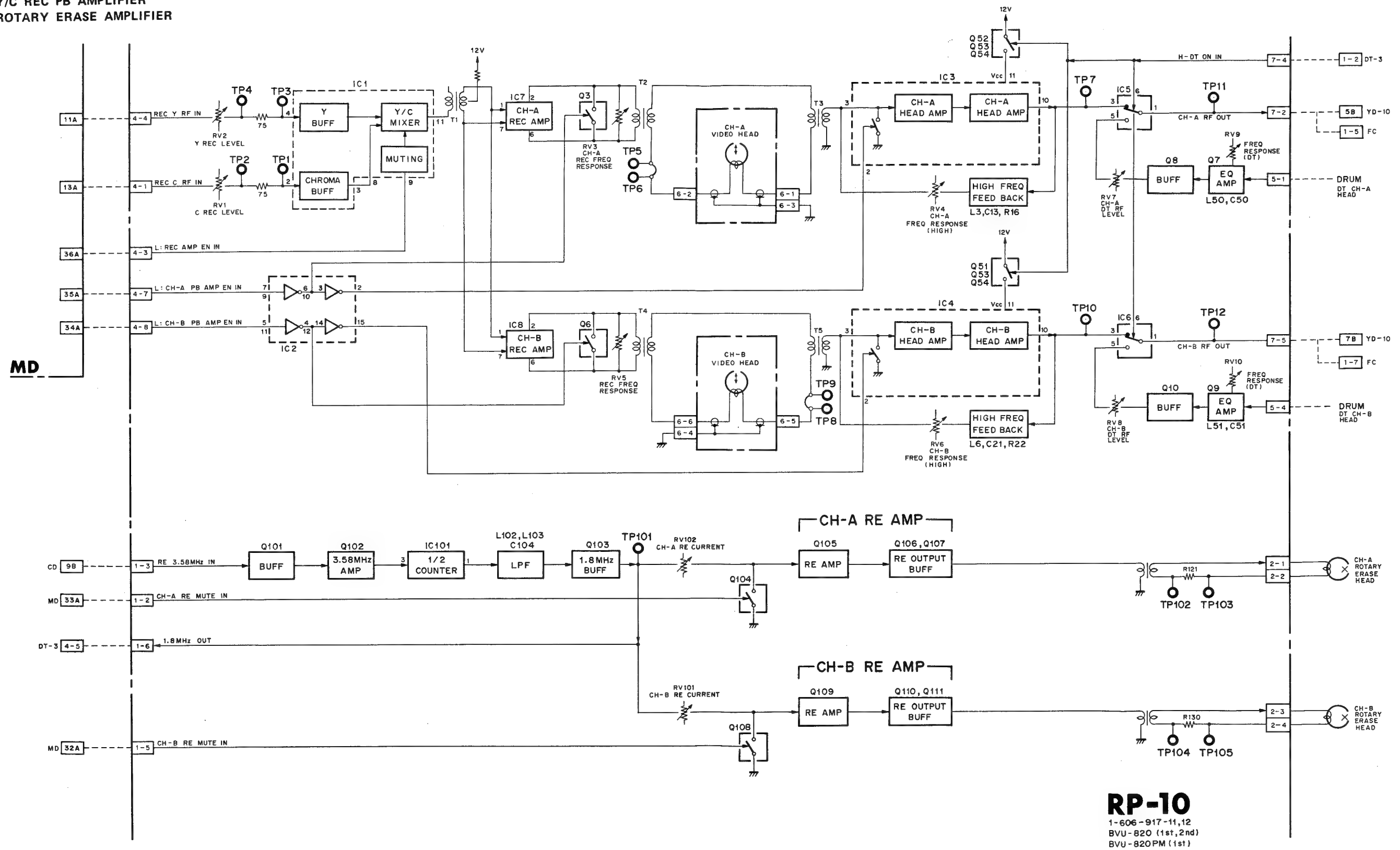
## Y/C MODULATOR



**MD-15**  
1-606-915-11~13  
BVU-820 (1st, 2nd)

# Y/C REC PB AMP / RE AMP      Y/C REC PB AMP / RE AMP

## Y/C REC PB AMPLIFIER ROTARY ERASE AMPLIFIER



Y DEMOD      Y DEMOD



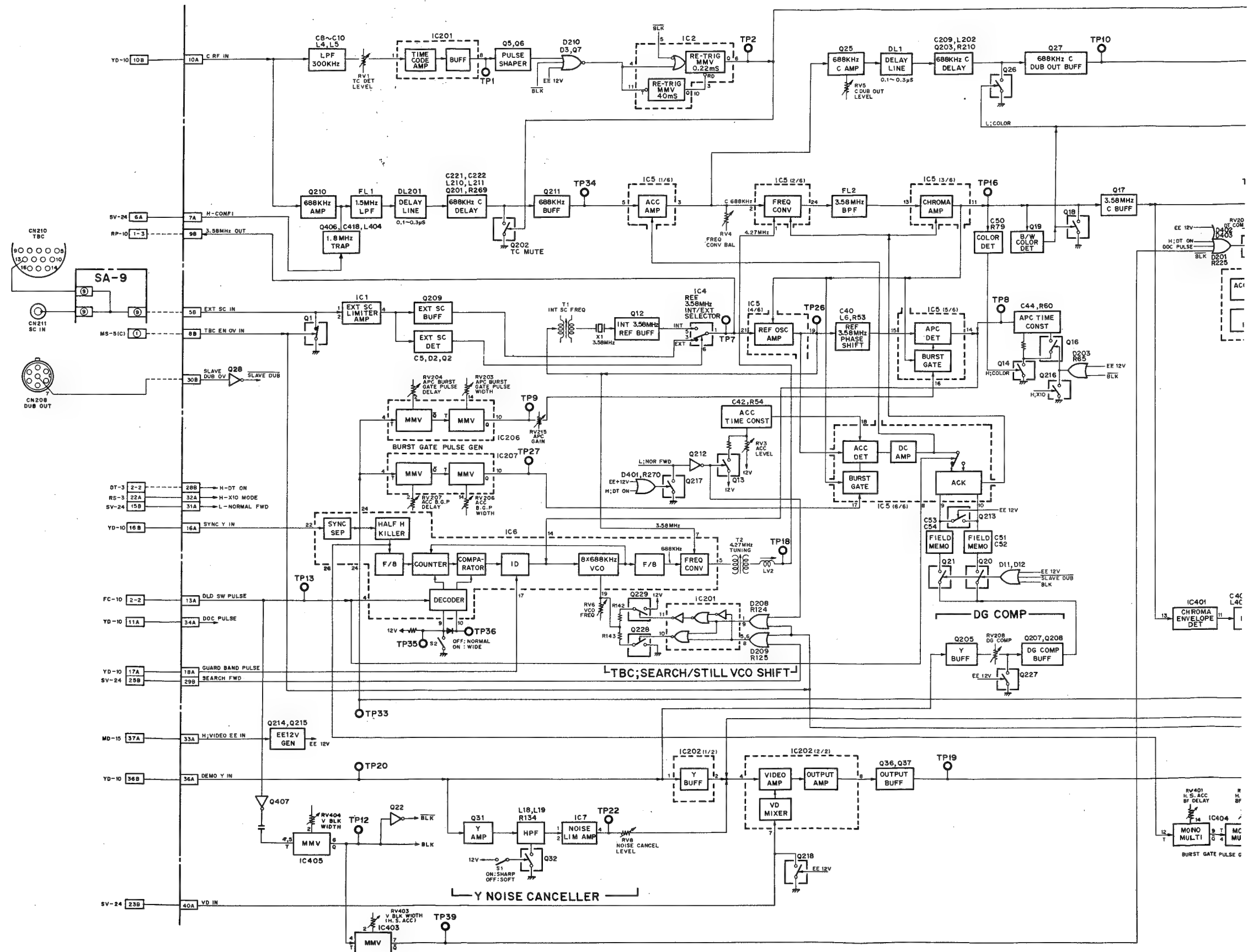
1-606-916-11~16  
BVU-820 (1st, 2nd)  
BVU-820PM (1st)

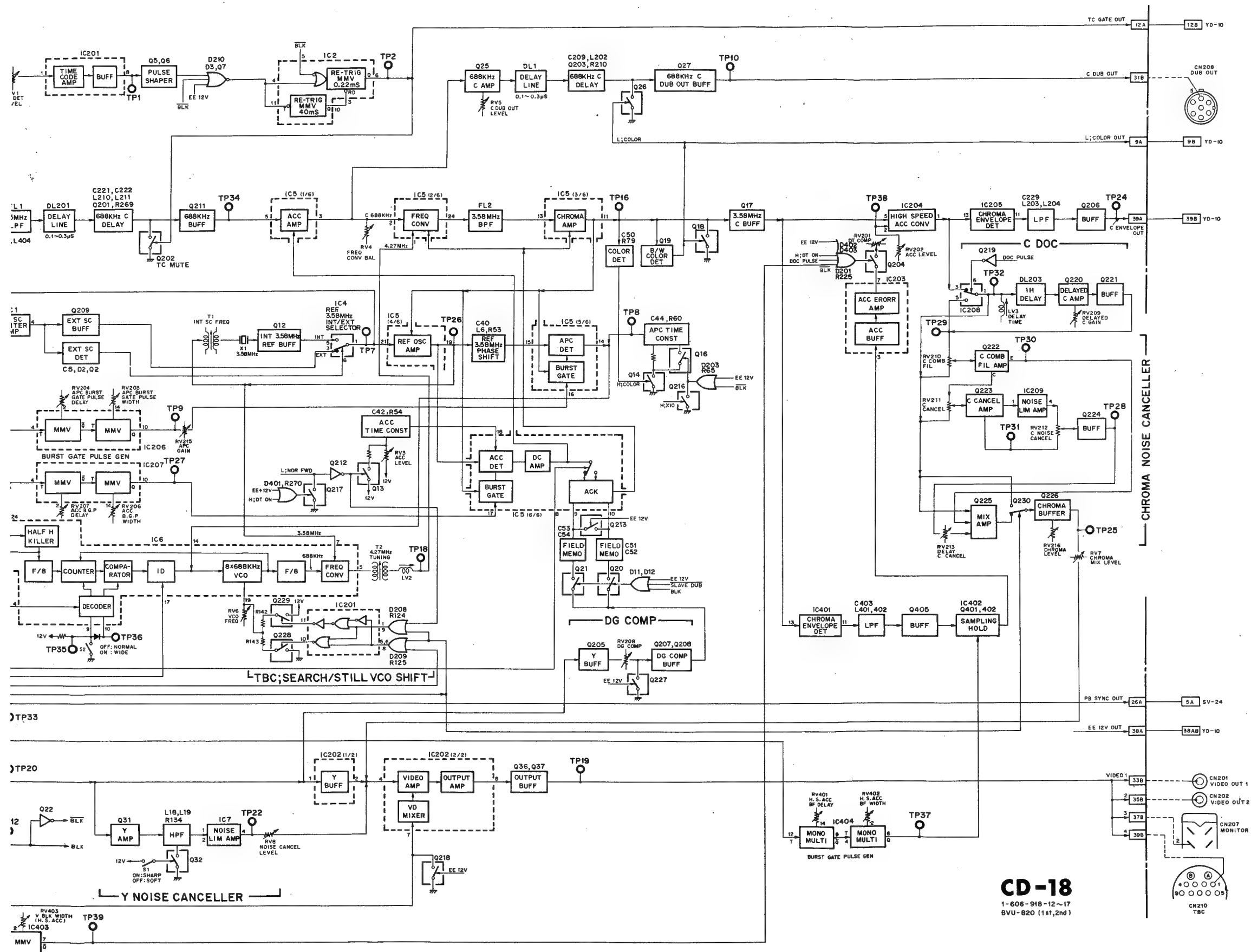


C DEMOD      C DEMOD

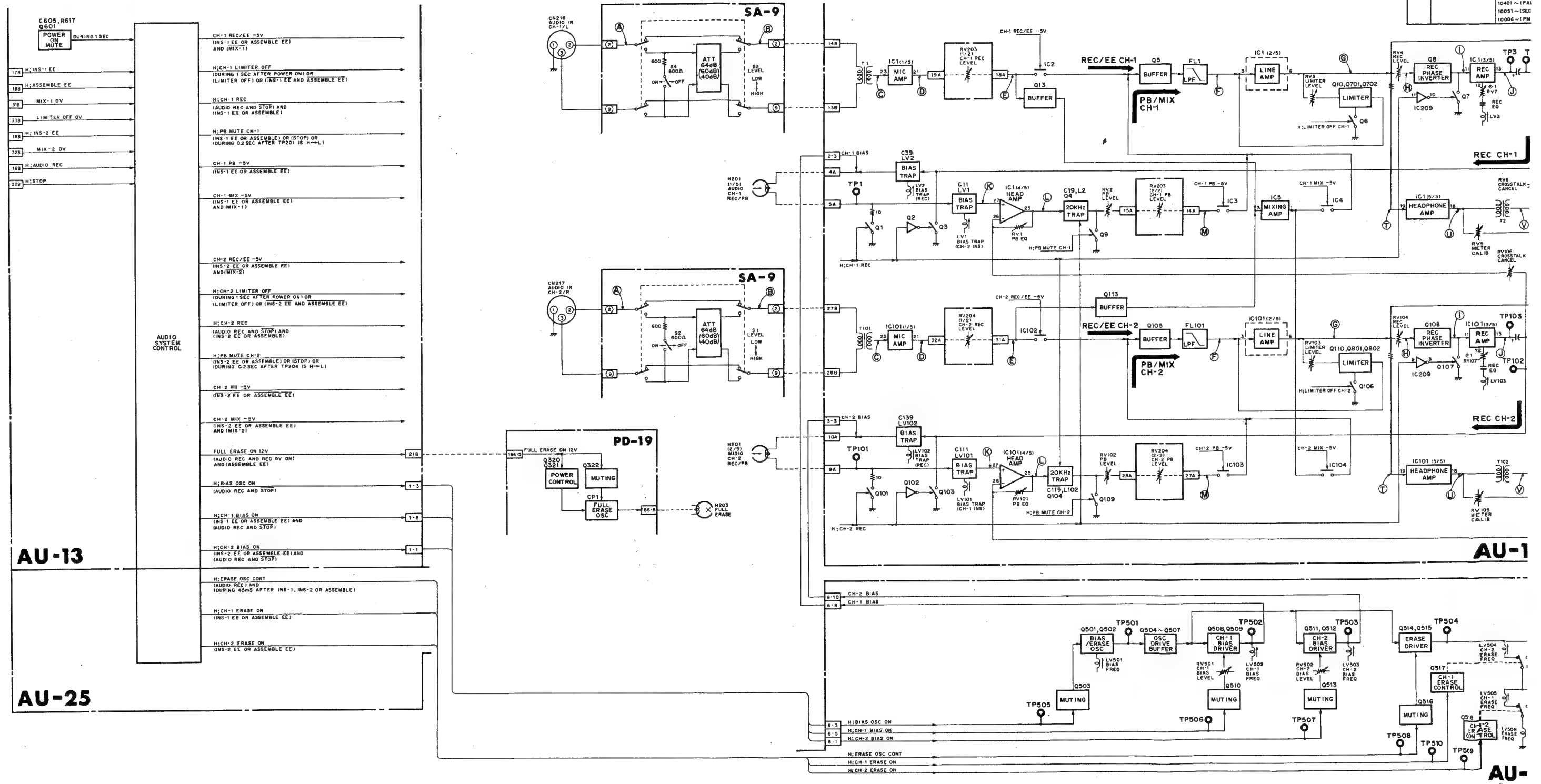
## CHROMA DEMODULATOR

Serial No. 10021 and higher (J)
Serial No. 10081 and higher (U/C)

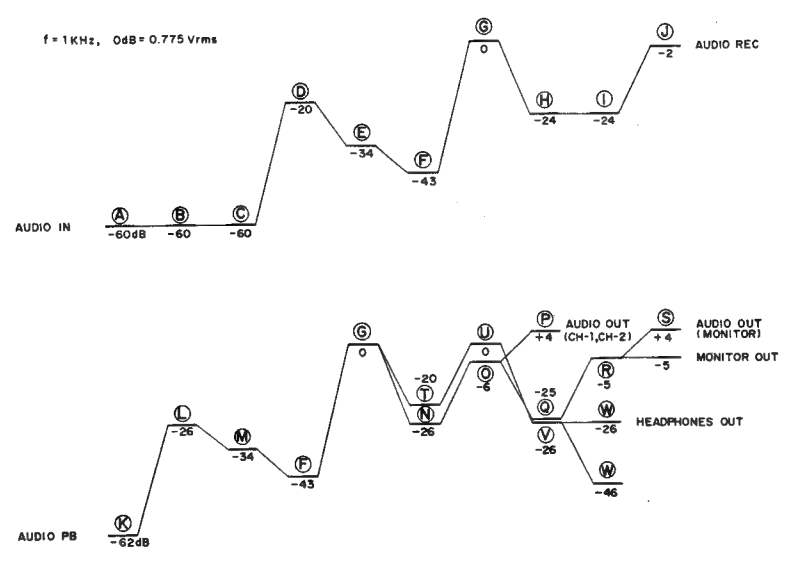




Serial No. 10021 and higher (J)
Serial No. 10081 and higher (U/C)

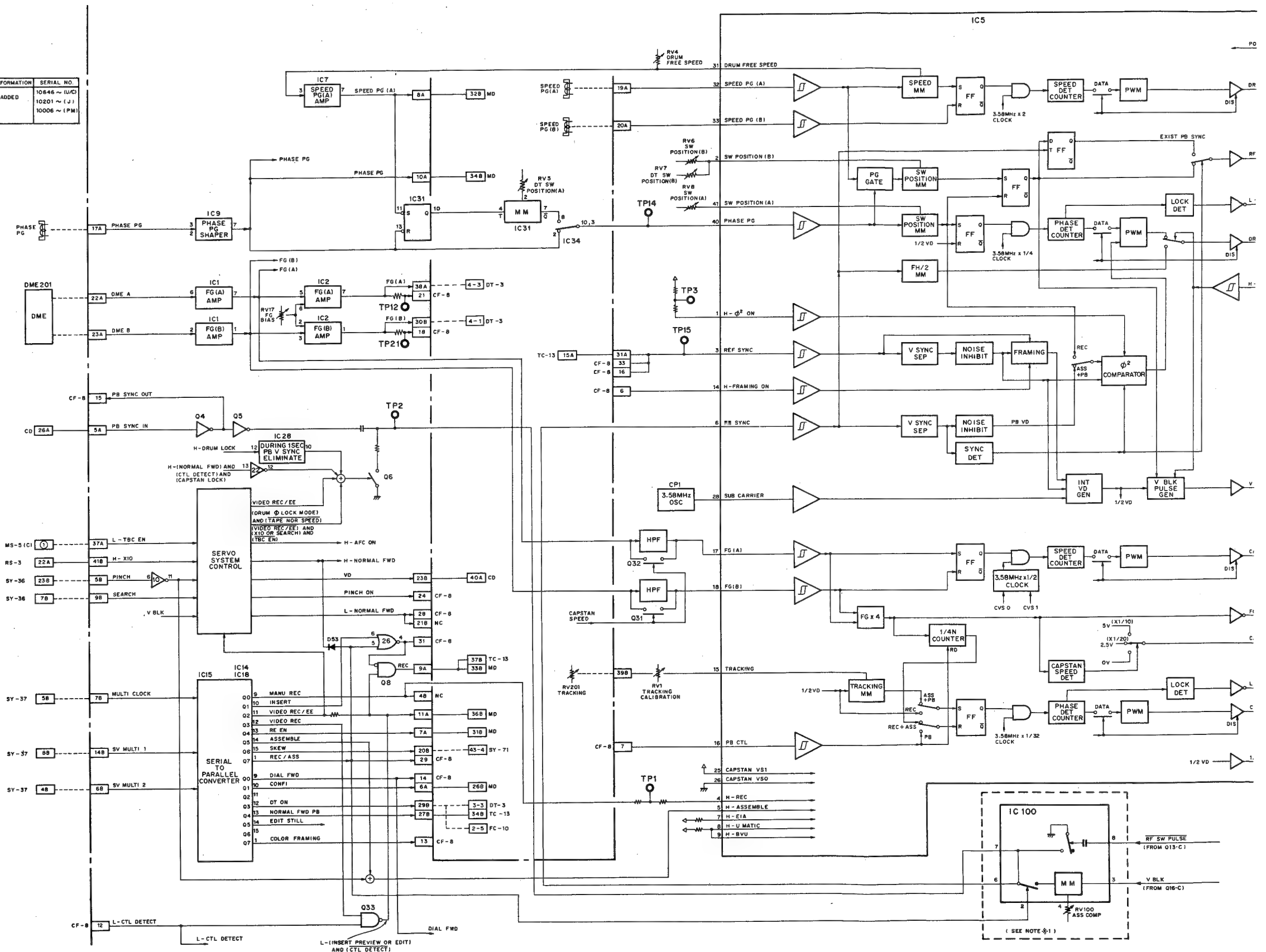


MARK	CHANGE INFORMATION	SERIAL NO.
② 1	RV7 } RV107 } SHORTED	10546 ~ (U/C) 10201 ~ (J) 10401 ~ (PAL) 10051 ~ (SECAM) 10006 ~ (PM)



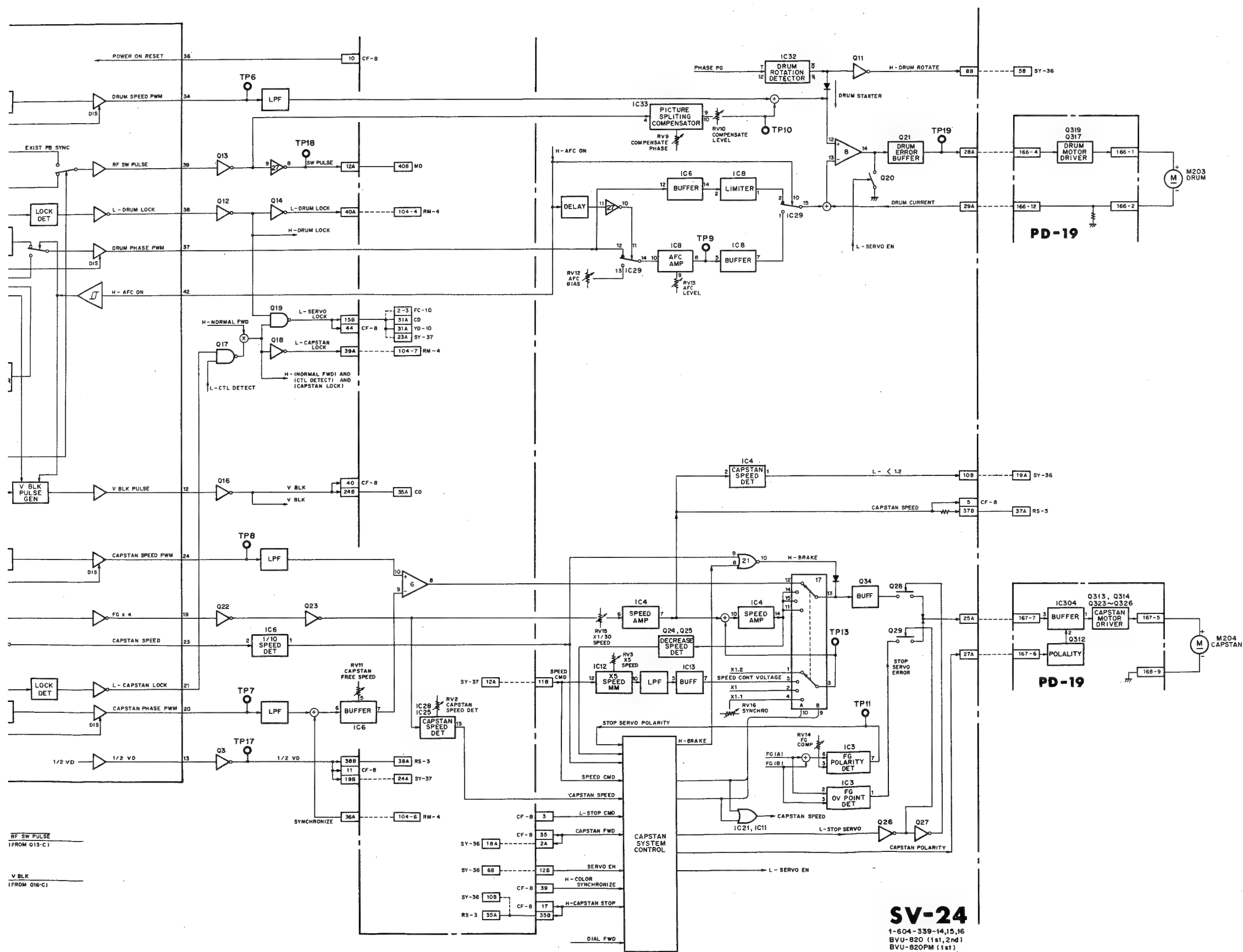
DRUM SERVO  
CAPSTAN SERVO

MARK	CHANGE INFORMATION	SERIAL NO.
1	IC100 } ADDED RV100 }	10846 ~ (U/D) 10201 ~ (J) 10006 ~ (PM)



# DRUM/CAPSTAN SERVO

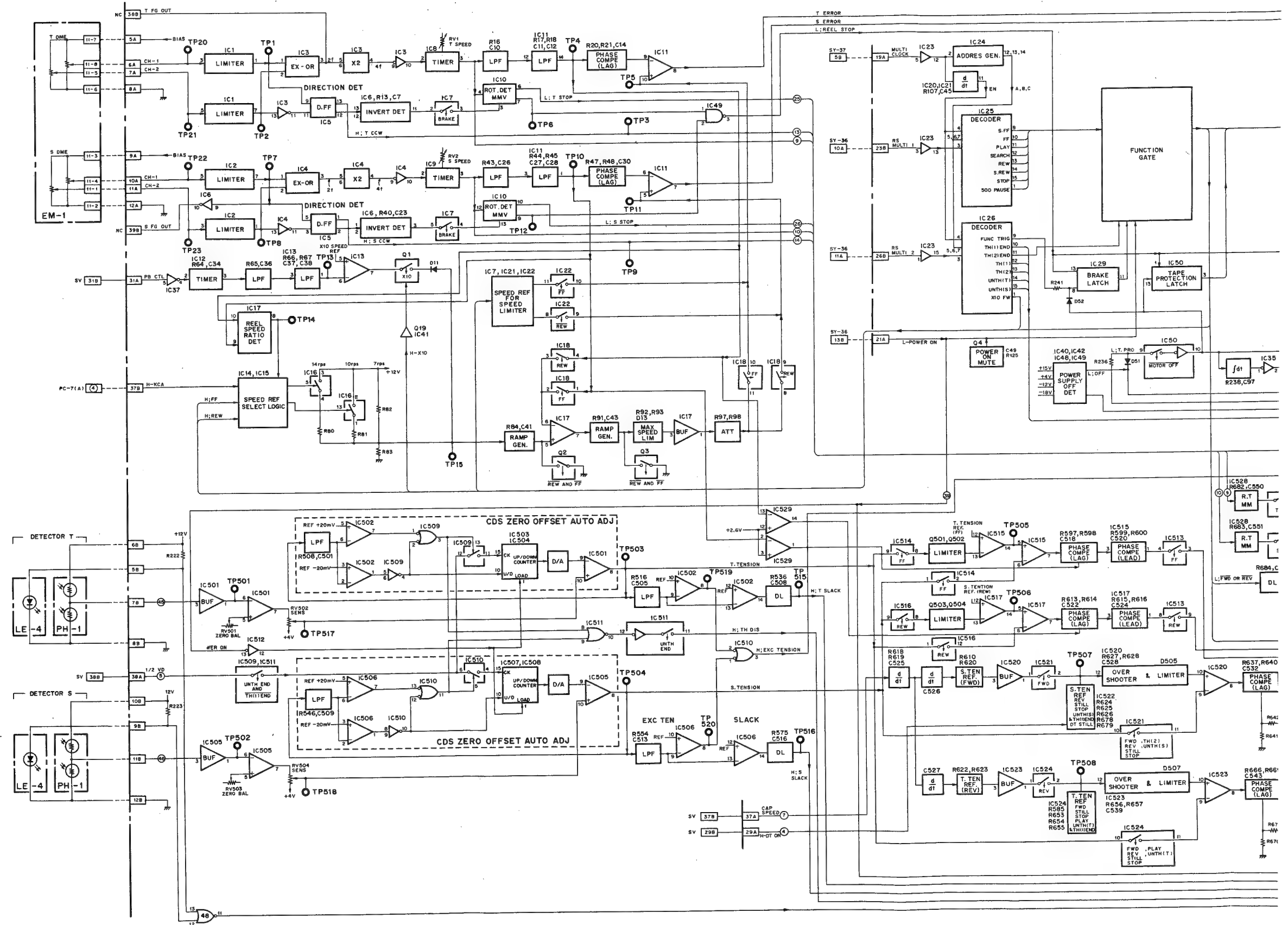
# DRUM/CAPSTAN SERVO



# REEL/TAPE TENSION SERVO

# REEL/TAPE TENSION SERVO

REEL SERVO  
TAPE TENSION SERVO



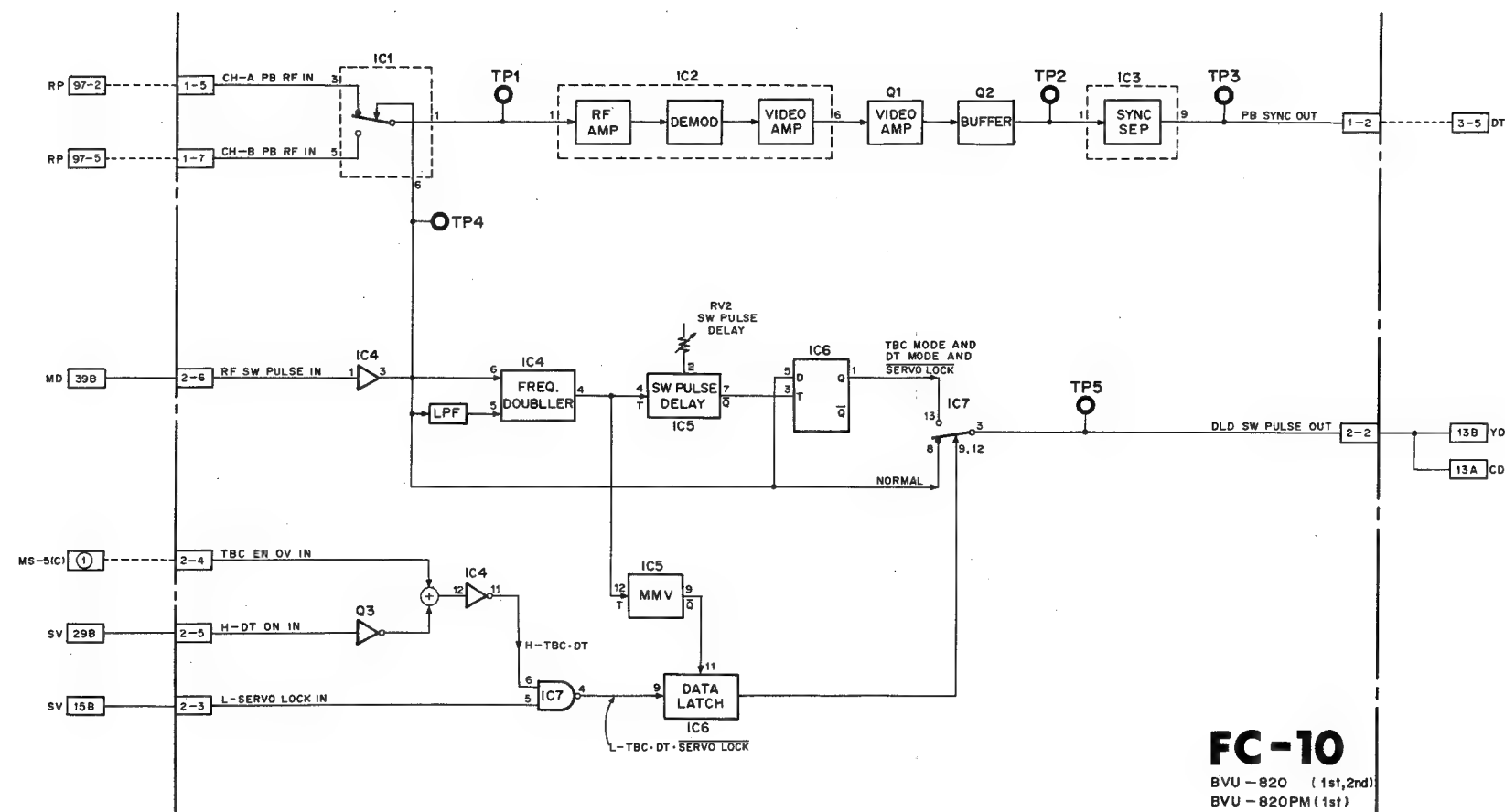
## REEL/TAPE TENSION SERVO





# SW PULSE DELAY SW PULSE DELAY

SWITCHING PULSE DELAY (IN TBC AND DT)



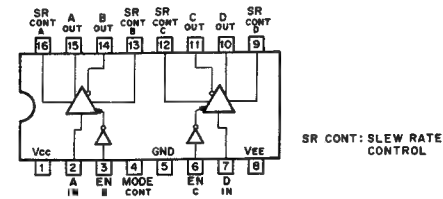


SECTION 16  
SEMICONDUCTOR ELECTRODES

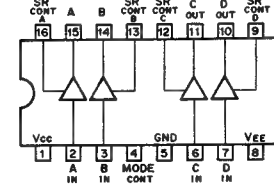
TYPE	INTERCHANGEABILITY					PAGE
AM26LS30PC AM26LS31PC AM26LS32PC BX343 BX350 BX373 BX375 BX388 BX389 BX3914 BX3915 BX3944	BX373A        BX3915A					16-3
CD4001BE CD4009UBE CD4011BE CD4012BE CD4013BE CD4015BE CD4018BE	TC4001BP TC4009UBP TC4011BP TC4012BP TC4013BP TC4015BP TC4018BP	HD14001BP  HD14011BP	μPD4001C  μPD4011C  μPD4013C	MB84001B MB84011B  MB84013B	MC14001BCP	16-4
CD4020BE CD4023BE CD4024BE CD4025BE CD4027BE CD4029BE CD4030BE	TC4020BP TC4023BP TC4024BP TC4025BP TC4027BP TC4029BP TC4030BP		μPD4023C μPD4024BC  μPD4027C μPD4029BC	MB84027B	MSM4024RS  MSM4029RS	16-5
CD4040BE CD4043BE CD4046BE CD4051BE	TC4040BP TC4043BP  TC4051BP				MC14046BCP MSM4051RS	16-6
CD4052BE CD4053BE CD4066BE CD4068BE CD4069UBE CD4071BE CD4072BE CD4073BE CD4075BE	TC4052BP TC4053BP TC4066BP TC4068BP TC4069UBP TC4071BP TC4072BP TC4073BP TC4075BP	HD14066BP  HD14069UBP		MB84053B  MB84069B		16-7
CD4077BE CD4078BE CD4081BE CD4082BE CD4085BE CD4093BE CD4099BE CD40161BE	TC4078BP TC4081BP TC4082BP TC4085BP TC4093BP TC4099BP TC40161BP	HD14081BP	μPD4078C μPD4081C	MB84077B MB84081B	MC14077BCP	16-8
CX130 CX131A CX133A CX134A CX135 CX170 CX188 CX756A CX757						16-9

TYPE	INTERCHANGEABILITY					PAGE
CX859 CX872  HA1807  LB1264  LM324 LM339  M54517P		NJM2902N	HA17902P	μPC324C μPC339C		16-10
M54519P M54529P  MB8532  MC14174BCP MC14510BCP MC14512BCP MC14516BCP						16-11
MC14519BCP MC14520BCP MC14528BCP MC14538BCP MC14539BCP MC14584BCP	TC40174BP TC4510BP TC4512BP TC4516BP			μPD4512C μPD4516C		16-12
MC14519BCP MC14520BCP MC14528BCP MC14538BCP MC14539BCP MC14584BCP	TC4520BP TC4528BP TC4539BP	HD14538BP		μPD4519C μPD4539C		16-13
MC14585BCP MC14598BCP NE555N  NJM2901N NJM2903D NJM4562D  RC4558  SN74LS05N	TC4585BP  M51841P					16-14
SN7407N SN74LS32N SN74LS74AN SN16913P SN74LS138N SN74LS139N SN74LS156N SN74LS158N						16-15
SN74LS244N SN74LS377N SN74LS378N SN74LS379N TA7060AP TA7069P TA7076P TA7617AP						16-16
TC5067BP TC40H074P TC40H368P  TL082CP TL191CN μA7800UC μA7900UC μPA54H μPA64H μPC311C μPD444C μPA76V		μPC14300H	μPC7800H			16-17

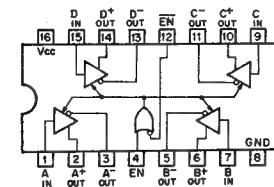
AM26LS30PC (ADVANCED MICRO DEVICE)  
DIFFERENTIAL RS-422 PARTY LINE/SINGLE ENDED RS-423 LINE DRIVER  
(RS-422) MODE CONTROL "LOW"



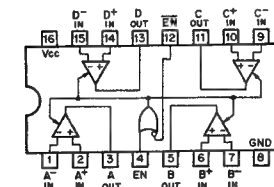
(RS-423) MODE CONTROL "HIGH"



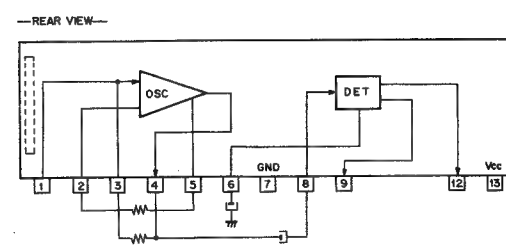
AM26LS31PC (ADVANCED MICRO DEVICE)  
HIGH SPEED DIFFERENTIAL LINE DRIVER  
-TOP VIEW-



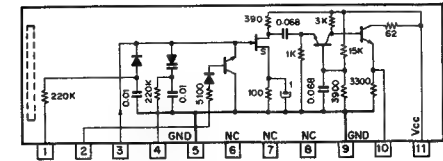
AM26LS32PC (ADVANCED MICRO DEVICE)  
HIGH SPEED DIFFERENTIAL LINE RECEIVER  
-TOP VIEW-



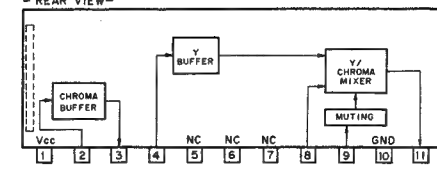
BX343 (SONY)  
OSCILLATOR/DETECTOR  
-REAR VIEW-



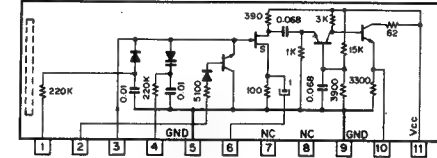
BX350 (SONY)  
VIDEO HEAD AMP/MUTING  
-REAR VIEW-



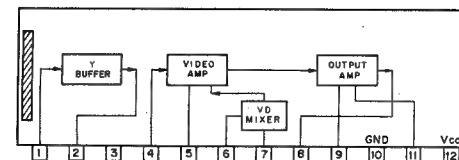
BX373 (SONY)  
BX373A (SONY)  
MIX AMP  
-REAR VIEW-



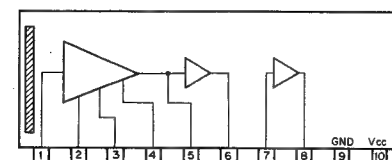
BX375 (SONY)  
VIDEO HEAD AMP/MUTING  
-REAR VIEW-



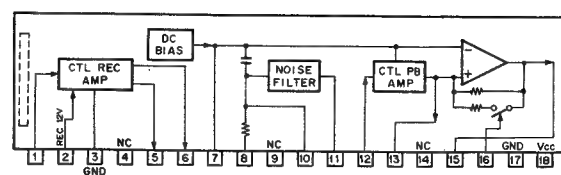
BX388 (SONY)  
VIDEO AMP/VD MIXER  
-IMPRINTED SIDE-



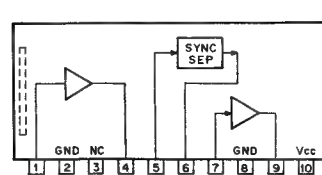
BX389 (SONY)  
VIDEO AMPLIFIER  
-IMPRINTED SIDE-



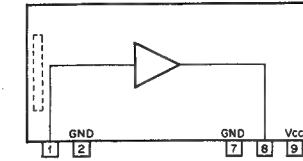
BX391A (SONY)  
CTL REC/PB AMPLIFIER  
-IMPRINTED SIDE-



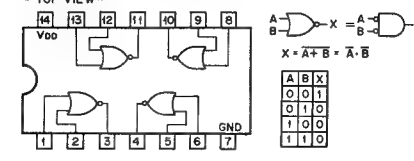
BX3915 (SONY)  
BX3915A (SONY)  
SYNC SEPARATOR  
-IMPRINTED SIDE-



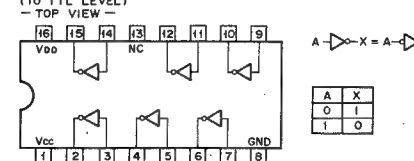
BX3944 (SONY)  
VIDEO HEAD AMPLIFIER  
-REAR VIEW-



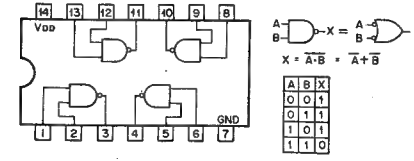
CD4001AE/BE (RCA)  
TC4001BP (TOSHIBA)  
HD14001BP (HITACHI)  
MB84001B (FUJITSU)  
μPD4001C (NEC)  
MC14001BCP (MOTOROLA)  
C-MOS 2-INPUT NOR GATE  
-TOP VIEW-



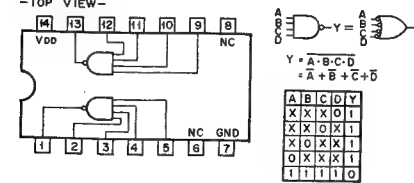
CD4009UBE (RCA)  
TC4009BP (TOSHIBA)  
C-MOS INVERTING TYPE BUFFER/CONVERTER  
(TO TTL LEVEL)  
-TOP VIEW-



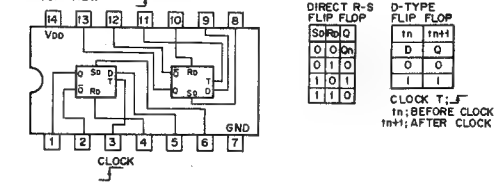
CD4011AE/BE (RCA)  
TC4011BP (TOSHIBA)  
HD14011BP (HITACHI)  
MB84011B (FUJITSU)  
μPD4011C (NEC)  
C-MOS 2-INPUT NAND GATE  
-TOP VIEW-



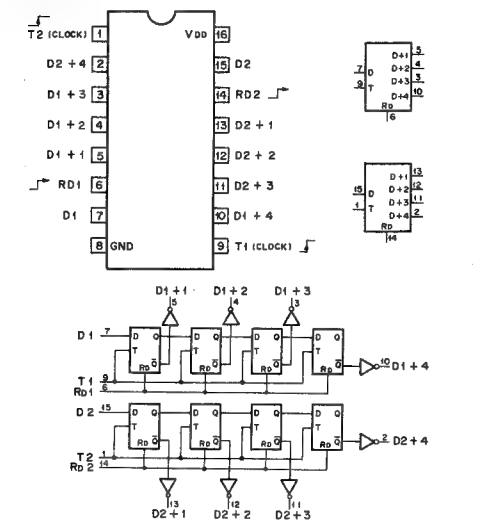
CD4012AE/BE (RCA)  
TC4012BP (TOSHIBA)  
C-MOS 4-INPUT NAND GATE  
-TOP VIEW-



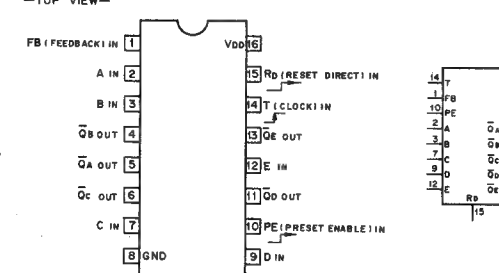
CD4013AE/BE (RCA)  
TC4013BP (TOSHIBA)  
MB84013B (FUJITSU)  
μPD4013C (NEC)  
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET  
-TOP VIEW-



CD4015AE/BE (RCA)  
TC4015BP (TOSHIBA)  
C-MOS DUAL 4-STAGE SHIFT REGISTER WITH DIRECT RESET  
-TOP VIEW-

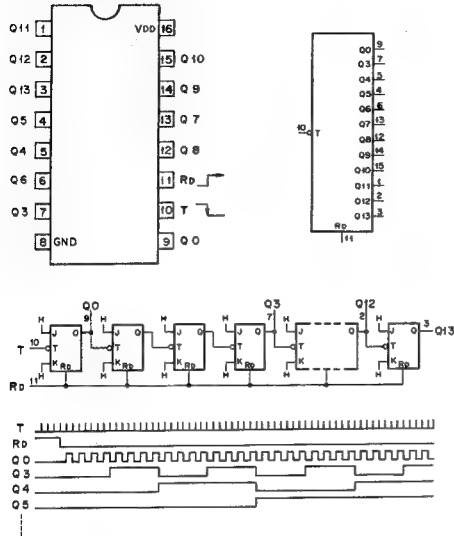


CD4018AE/BE (RCA)  
TC4018BP (TOSHIBA)  
C-MOS PRESETTABLE DIVIDE-BY-N COUNTER  
-TOP VIEW-

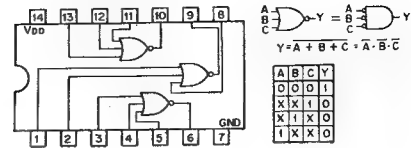


DIVIDE BY	CONNECT TO FB	VIA	RESULTS FROM EACH Q OUTPUT
10	Q <sub>e</sub>	DIRECT	5 COUNTS HIGH, 5 COUNTS LOW
9	Q <sub>d</sub> , Q <sub>e</sub>	AND GATE	5 COUNTS HIGH, 4 COUNTS LOW
8	Q <sub>d</sub>	DIRECT	4 COUNTS HIGH, 4 COUNTS LOW
7	Q <sub>c</sub> , Q <sub>d</sub>	AND GATE	4 COUNTS HIGH, 3 COUNTS LOW
6	Q <sub>c</sub>	DIRECT	3 COUNTS HIGH, 3 COUNTS LOW
5	Q <sub>b</sub> , Q <sub>c</sub>	AND GATE	3 COUNTS HIGH, 2 COUNTS LOW
4	Q <sub>b</sub>	DIRECT	2 COUNTS HIGH, 2 COUNTS LOW
3	Q <sub>a</sub> , Q <sub>b</sub>	AND GATE	2 COUNTS HIGH, 1 COUNTS LOW
2	Q <sub>a</sub>	DIRECT	1 COUNTS HIGH, 1 COUNTS LOW

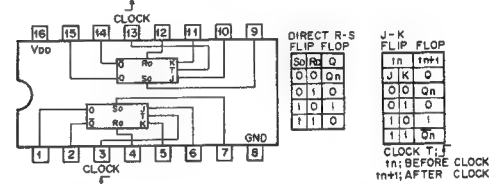
CD4020AE/BE (RCA)  
TC4020BP (TOSHIBA)  
C-MOS 14-STAGE RIPPLE-CARRY BINARY COUNTER/DRIVER  
- TOP VIEW -



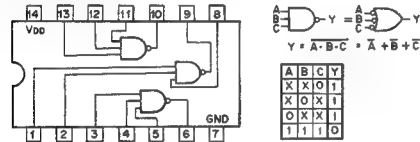
CD4025AE/BE (RCA)  
TC4025BP (TOSHIBA)  
C-MOS 3-INPUT NOR GATE  
- TOP VIEW -



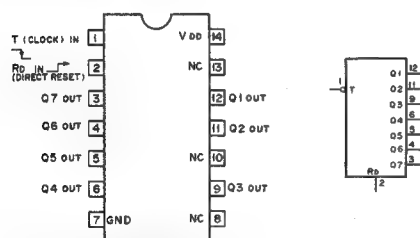
CD4027AE/BE (RCA)  
TC4027BP (TOSHIBA)  
M984027B (FUJITSU)  
μPD4027C (NEC)  
C-MOS J-K MASTER SLAVE FLIP FLOP WITH DIRECT SET/RESET  
- TOP VIEW -



CD4023AE/BE (RCA)  
TC4023BP (TOSHIBA)  
μPD4023C (NEC)  
C-MOS 3-INPUT NAND GATE  
- TOP VIEW -

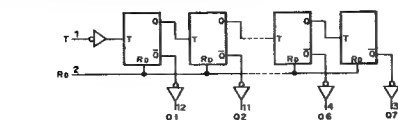


CD4024AE/BE (RCA)  
TC4024BP (TOSHIBA)  
μPD4024BC (NEC)  
MSM4024RS (OKI)  
C-MOS ASYNCHRONOUS 7-BIT BINARY COUNTER  
- TOP VIEW -

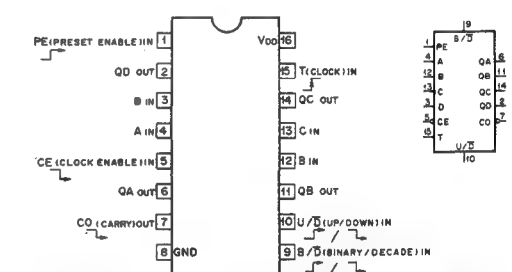


COUNT	T	R <sub>D</sub>	Q7	Q8	Q5	Q4	Q3	Q2	Q1
0	X	1	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	1
2	1	0	0	0	0	0	0	1	0
3	1	0	0	0	0	0	1	1	1
4	1	0	0	0	0	1	1	0	0
125	1	0	1	1	1	1	1	0	1
126	1	0	1	1	1	1	1	1	0
127	1	0	1	1	1	1	1	1	1
—	0	0	—	—	—	—	—	—	—
—	1	0	—	—	—	—	—	—	—

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE



CD4029AE/BE (RCA)  
TC4029BP (TOSHIBA)  
μPD4029C (NEC)  
MSM4029RS (OKI)  
C-MOS PRESETTABLE 4-BIT BINARY/DECADE UP/DOWN COUNTER  
- TOP VIEW -



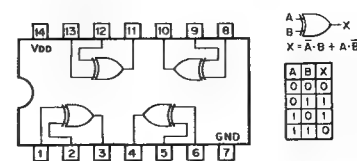
INPUTS				MODE	STATE	OUTPUTS			
CE	PE	U/D	B/D			CO	Q0	Q1	Q2
0	0	1	X	UP COUNT	0	0	0	0	1
0	0	0	X	DOWN COUNT	1	0	0	0	1
X	1	X	X	PRESET	2	0	1	0	1
1	0	X	X	NO COUNT	3	0	1	1	1
0	0	X	1	BINARY COUNT	4	0	1	0	1
0	0	X	0	DECADE COUNT	5	0	1	1	1
0	0	0	0		6	0	1	1	1
0	0	1	1		7	0	1	1	1
0	0	1	0		8	1	0	0	1
0	0	1	0		9	1	0	0	1
0	0	1	0		10	1	0	1	1
0	0	1	0		11	1	0	1	1
0	0	1	0		12	1	1	0	1
0	0	1	0		13	1	1	0	1
0	0	1	0		14	1	1	1	0
0	0	1	0		15	1	1	1	0

0: LOW  
 1: HIGH  
 X: LOW OR HIGH

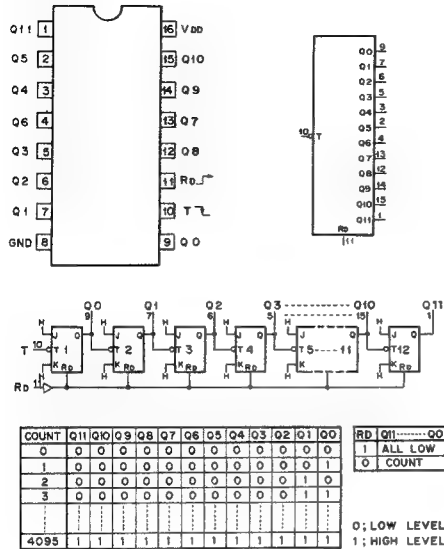
BINARY COUNTER  
 DECADE COUNTER  
 UP  
 DOWN  
 UP  
 DOWN

NOTE: CO IS HIGH WHEN CE IS HIGH, REGARDLESS OTHER CONDITIONS.

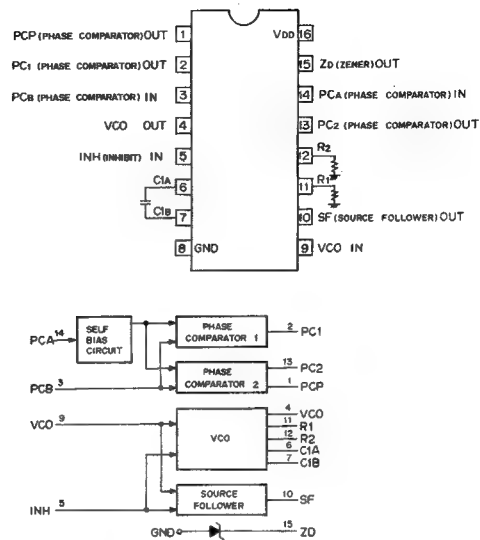
CD4030AE/BE (RCA)  
TC4030BP (TOSHIBA)  
C-MOS EXCLUSIVE OR GATE  
- TOP VIEW -



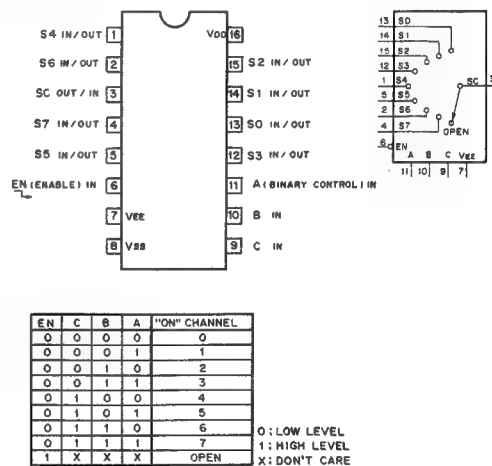
CD4040AE/BE (RCA)  
TC4040BP (TOSHIBA)  
C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DRIVER  
— TOP VIEW —



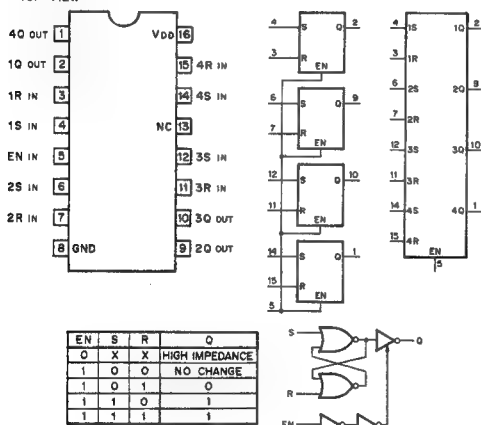
CD4046AE/BE (RCA)  
MC14046BCP (MOTOROLA)  
C-MOS PHASE LOCKED LOOP  
— TOP VIEW —



CD4051BE (RCA)  
HD14051BP (HITACHI)  
TC4051BP (TOSHIBA)  
μPD4051BC (NEC)  
MSM4051RS (OKI)  
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER  
— TOP VIEW —

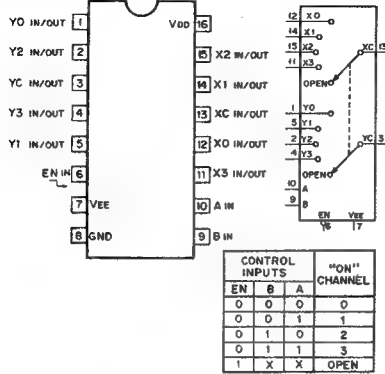


CD4043BE (RCA)  
TC4043BP (TOSHIBA)  
C-MOS POSITIVE NOR R/S FLIP-FLOP  
— TOP VIEW —



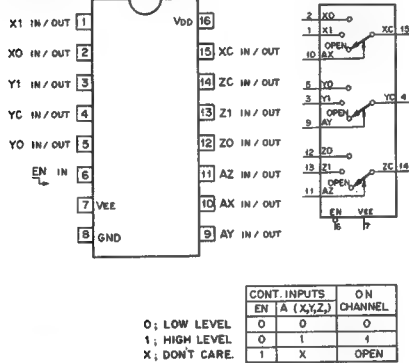
CD4052BE (RCA)  
TC4052BP (TOSHIBA)  
C-MOS 4-CHANNEL MULTIPLEXER/DEMULTIPLEXER

-TOP VIEW-



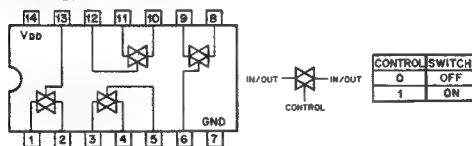
CD4053BE (RCA)  
TC4053BP (TOSHIBA)  
MB84053B (FUJITSU)  
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER

-TOP VIEW-



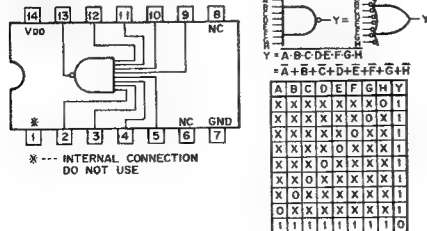
CD4066AE/BE (RCA)  
TC4066BP (TOSHIBA)  
HD14066BP (HITACHI)  
C-MOS BILATERAL ANALOG SWITCH

-TOP VIEW-



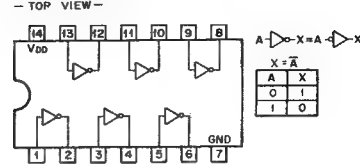
CD4068BE (RCA)  
TC4068BP (TOSHIBA)  
C-MOS 8-INPUT NAND GATE

-TOP VIEW-



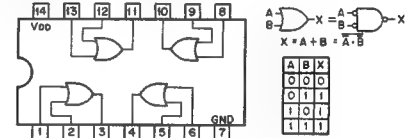
CD4069UBE (RCA)  
TC4069UBP (TOSHIBA)  
HD14069UBP (HITACHI)  
MB84069B (FUJITSU)  
μPD4069C (NEC)  
C-MOS INVERTER

-TOP VIEW-



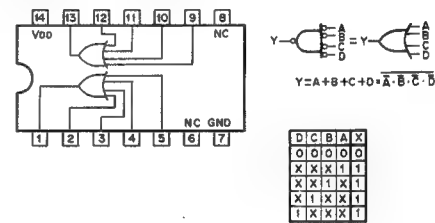
CD4071BE (RCA)  
TC4071BP (TOSHIBA)  
C-MOS 2-INPUT OR GATE

-TOP VIEW-



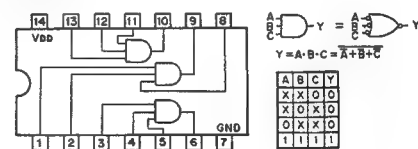
CD4072BE (RCA)  
TC4072BP (TOSHIBA)  
C-MOS 4-INPUT OR GATE

-TOP VIEW-



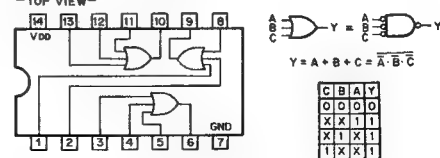
CD4073BE (RCA)  
TC4073BP (TOSHIBA)  
C-MOS 3-INPUT POSITIVE AND GATE

-TOP VIEW-

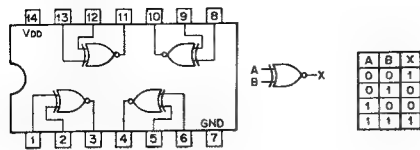


CD4075BE (RCA)  
TC4075BP (TOSHIBA)  
C-MOS 3-INPUT OR GATE

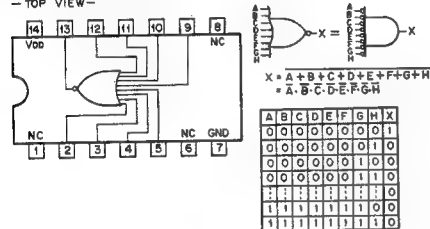
-TOP VIEW-



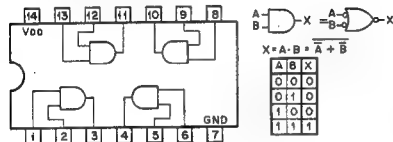
CD4077BE (RCA)  
MB84077B (FUJITSU)  
MC14077BCP (MOTOROLA)  
C-MOS EXCLUSIVE NOR GATE  
—TOP VIEW—



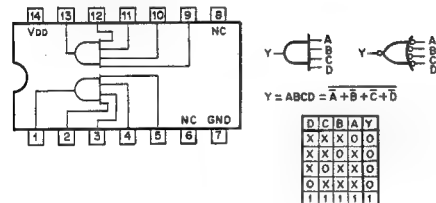
CD4078BE (RCA)  
TC4078BP (TOSHIBA)  
μPD4078C (NEC)  
C-MOS 8-INPUT NOR GATE  
—TOP VIEW—



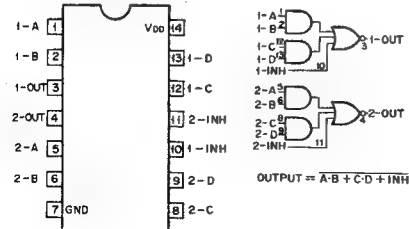
CD4081BE (RCA)  
TC4081BP (TOSHIBA)  
HD14081BP (HITACHI)  
MB84081B (FUJITSU)  
μPD4081C (NEC)  
C-MOS 2-INPUT AND GATE  
—TOP VIEW—



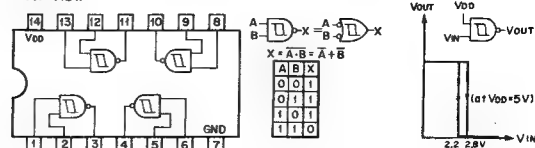
CD4082BE (RCA)  
TC4082BP (TOSHIBA)  
C-MOS 4-INPUT AND GATE  
—TOP VIEW—



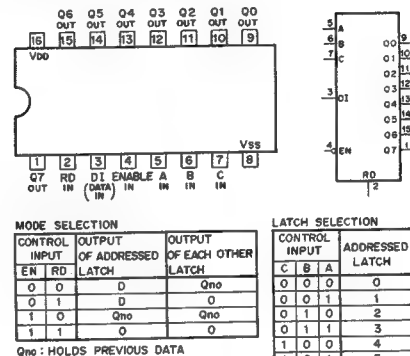
CD4085BE (RCA)  
TC4085BP (TOSHIBA)  
C-MOS DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATE  
—TOP VIEW—



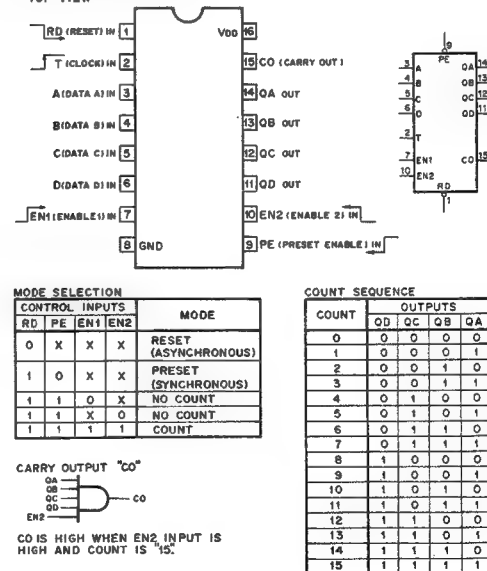
CD4093BE (RCA)  
TC4093BP (TOSHIBA)  
C-MOS 2-INPUT NAND SCHMITT TRIGGER  
—TOP VIEW—



CD4099BE (RCA)  
TC4099BP (TOSHIBA)  
C-MOS 8-BIT ADDRESSABLE LATCH  
—TOP VIEW—



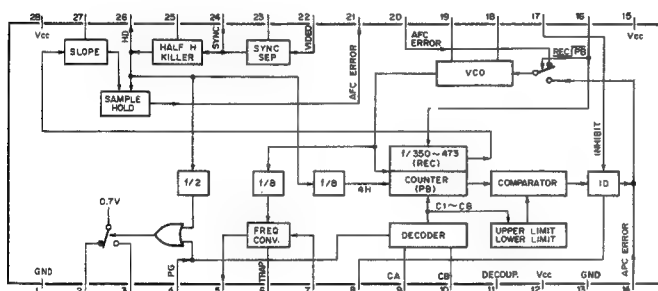
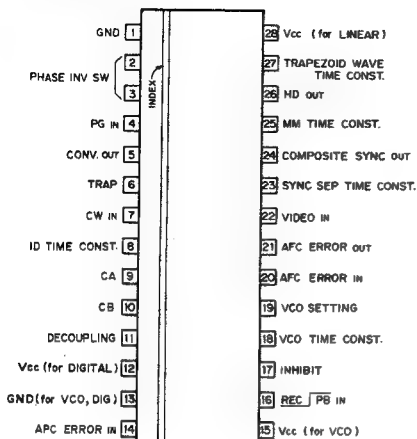
CD40161BE (RCA)  
TC40161BP (TOSHIBA)  
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER WITH ASYNCHRONOUS RESET  
—TOP VIEW—







CX859 (SONY)  
— TOP VIEW —



DECODER TRUTH TABLE

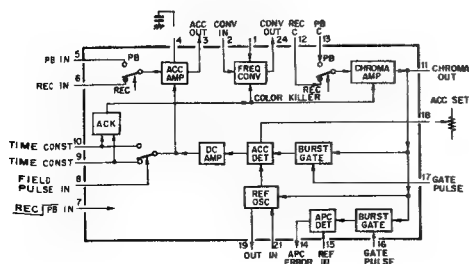
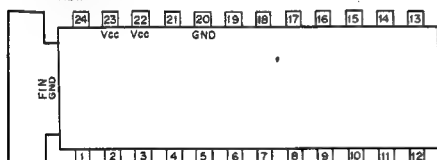
CA	CB	LOW	OPEN	HIGH
LOW	C1	C7	—	—
OPEN	C4	C8	C6	—
HIGH	—	*C2	*C3	C8

\* PG:L---C2  
PG:H---C3

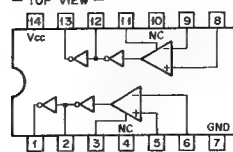
AFC/APC PRESET DATA

	AFC COUNT DOWN	APC ID COUNT	
		UPPER LIM.	LOWER LIM.
C1	f/473	105	95
C2	f/351	129	119
C3	f/353	137	127
C4	f/351	118	104
C5	f/351	131	117
C6	f/351	144	130
C7	f/350	136	104
C8	—	125	115

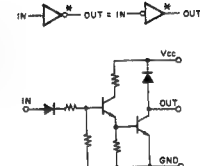
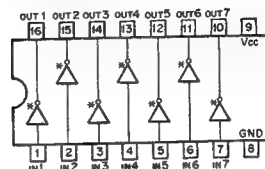
CX872 (SONY)  
— TOP VIEW —



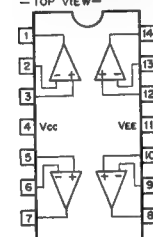
HA1807 (HITACHI)  
VOLTAGE COMPARATOR  
— TOP VIEW —



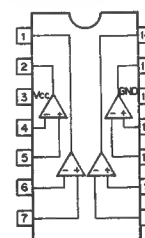
LB 1264 (SANYO)  
7 STAGE DRIVER  
— TOP VIEW —



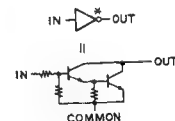
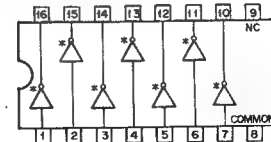
LM324 (NSC)  
μPC324C (NEC)  
HA17902P (HITACHI)  
NJM2802N (JRC)  
QUAD. OP. AMPLIFIER  
— TOP VIEW —



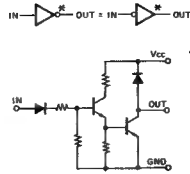
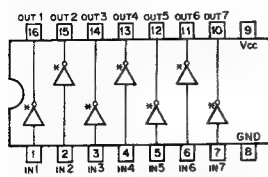
LM339 (NSC)  
μPC339C (NEC)  
COMPARATOR  
— TOP VIEW —



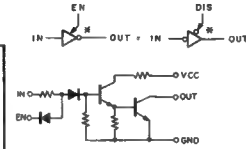
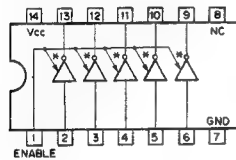
M54517P (MITSUBISHI)  
TRANSISTOR ARRAY  
— TOP VIEW —



**M54519P (MITSUBISHI)**  
7 STAGE DRIVER  
— TOP VIEW —

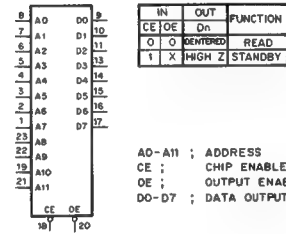
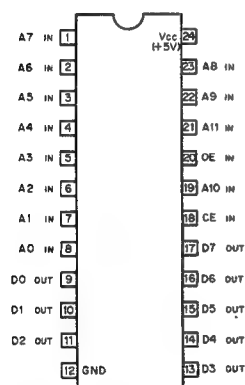


**M54529P (MITSUBISHI)**  
TRANSISTOR ARRAY  
— TOP VIEW —



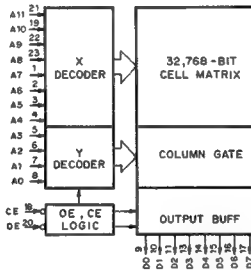
IN	EN	OUT
0	1	1
1	1	0
X	0	OPEN

**MB8532 (FUJITSU)**  
32K(4K×8) UV ERASABLE PROM  
— TOP VIEW —

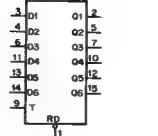
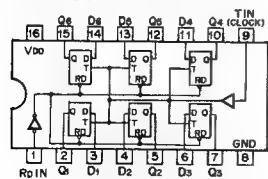


IN	OUT	FUNCTION
CE	OE	Dn
0	0	MENTORED
1	X	HIGH Z
X	0	STANDBY

A0-A11 ; ADDRESS  
CE ; CHIP ENABLE  
OE ; OUTPUT ENABLE  
D0-D7 ; DATA OUTPUTS



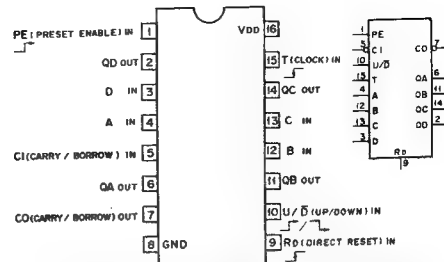
**MC14174BCP (MOTOROLA)**  
**TC40174BP (TOSHIBA)**  
C-MOS D-TYPE FLIP-FLOP  
— TOP VIEW —



INPUTS	OUTPUT
T D R Q	Q
X 0 1 0	0
X 1 1 1	1
X 1 0 0	Qn
X X 0 0	0

0; LOW LEVEL  
1; HIGH LEVEL  
X; DON'T CARE

**MC14510BCP (MOTOROLA)**  
**TC4510BP (TOSHIBA)**  
C-MOS PRESETTABLE BCD UP/DOWN COUNTER  
— TOP VIEW —



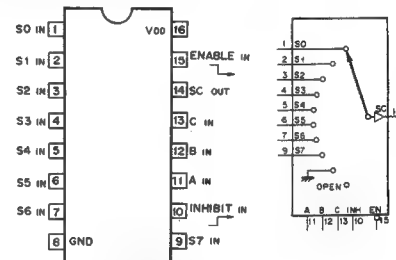
INPUTS	OUTPUTS
T RD PE CI U/D	QD QC QB QA
X 1 X X X	0 0 0 0
X 0 1 X X	SET TO A,B,C,D
X 0 0 0 1	COUNT UP
X 0 0 0 0	COUNT DOWN
X 0 0 X X	NO CHANGE
X 0 0 1 X	NO CHANGE

COUNT	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

CO=L  
CI=L B(DOWN-COUNT "0" OR UP-COUNT "9")

COUNT UP  
COUNT DOWN

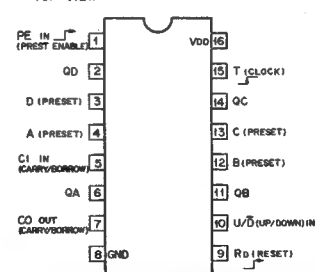
**MC14512BCP(MOTOROLA)**  
**TC4512BP (TOSHIBA)**  
**μPD4512C (NEC)**  
C-MOS 8-CHANNEL DATA SELECTOR/MULTIPLEXER  
— TOP VIEW —



CONTROL INPUTS	OUTPUT
EN/INH C B A SC	
0 0 0 0 0	S0
0 0 0 0 1	S1
0 0 0 1 0	S2
0 0 0 1 1	S3
0 0 1 0 0	S4
0 0 1 0 1	S5
0 0 1 1 0	S6
0 0 1 1 1	S7
0 1 X X X	GND
1 X X X X	OPEN

0; LOW LEVEL  
1; HIGH LEVEL  
X; LOW OR HIGH

**MC14516BCP (MOTOROLA)**  
**TC4516BP (TOSHIBA)**  
**μPD4516C (NEC)**  
C-MOS PRESETTABLE BINARY UP/DOWN COUNTER  
— TOP VIEW —



INPUTS	OUTPUTS
T RD PE CI U/D	QD QC QB QA
X 1 X X X	0 0 0 0
X 0 1 X X	SET TO A,B,C,D
X 0 0 0 1	COUNT UP
X 0 0 0 0	COUNT DOWN
X 0 0 X X	NO CHANGE
X 0 0 1 X	NO CHANGE

COUNT	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

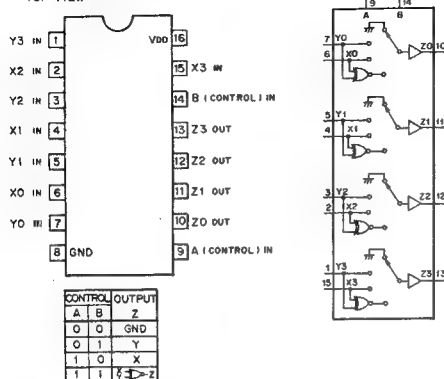
CO=L  
CI=L B(DOWN-COUNT "0" OR UP-COUNT "15")

COUNT UP  
COUNT DOWN

MC14519BCP (MOTOROLA)  
 $\mu$ PD4519C (NEC)

C-MOS 4-BIT AND/OR SELECTOR  
 2-CHANNEL DATA SELECTOR  
 EXCLUSIVE "NOR" GATE

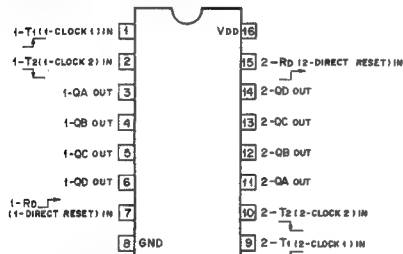
— TOP VIEW —



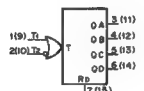
MC14520BCP (MOTOROLA)  
 TC4520BP (TOSHIBA)

C-MOS DUAL 4-BIT BINARY UP COUNTER

— TOP VIEW —



STATE	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
QD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

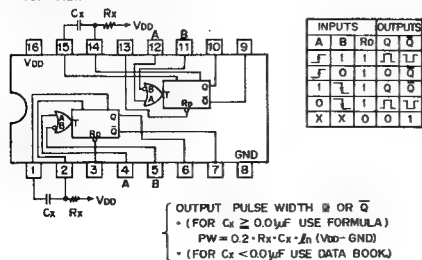


T1	T2	RD	ACTION
1	0	0	INCREMENT COUNTER
0	1	0	INCREMENT COUNTER
1	0	1	NO CHANGE
0	1	1	NO CHANGE
1	1	0	NO CHANGE
0	0	1	NO CHANGE
1	1	1	NO CHANGE
0	0	0	QA THRU QD = 0

MC14528BCP (MOTOROLA)  
 TC4528BP (TOSHIBA)

C-MOS RETRIGGERABLE / RESETTABLE MMV

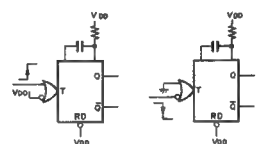
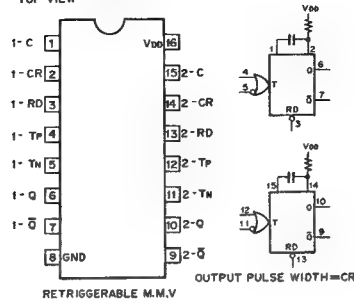
— TOP VIEW —



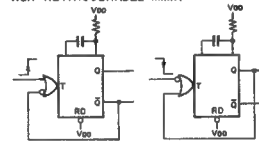
MC14538BCP (MOTOROLA)  
 HD14538BP (HITACHI)

C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE  
 MONOSTABLE MULTIVIBRATOR

— TOP VIEW —



NON-RETRIGGERABLE M.M.V.

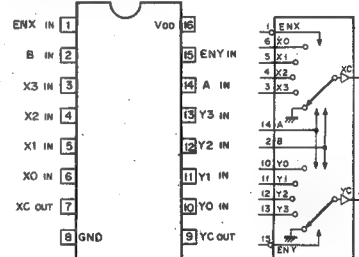


MC14539BCP (MOTOROLA)  
 TC4539BP (TOSHIBA)

$\mu$ PD4539C (NEC)

C-MOS DUAL 4-CHANNEL DATA SELECTOR/MULTIPLEXER

— TOP VIEW —

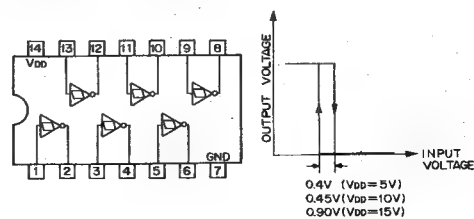


EN	B	A	CHANNEL
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	GND

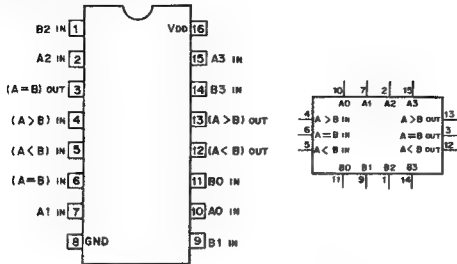
MC14584BCP (MOTOROLA)

C-MOS SCHMITT TRIGGER INVERTER

— TOP VIEW —

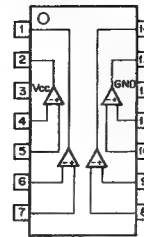


MC14585BCP (MOTOROLA)  
TC4585BP (TOSHIBA)  
C-MOS 4-BIT MAGNITUDE COMPARATOR  
-TOP VIEW-

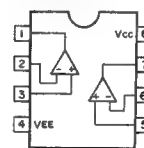


DATA COMPARING				CASCADING			OUTPUTS		
A3,B3	A2,B2	A1,B1	A0,B0	A<B	A=B	A>B	A<B	A=B	A>B
A3>B3	X	X	X						
A3=B3	A2>B2	X	X						
A3=B3	A2=B2	A1>B1	X						
A3=B3	A2=B2	A1=B1	A0>B0						
A=B	A3=B3	A2=B2	A1=B1	A0=B0					
A<B	A3=B3	A2=B2	A1<B1	X					
A3<B3	X	X	X						

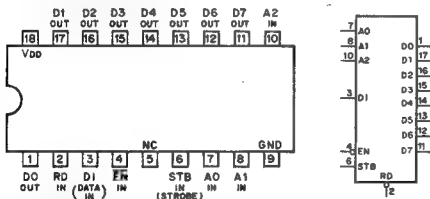
NJM2901N (JRC)  
SINGLE SUPPLY COMPARATOR  
-TOP VIEW-



NJM2903D (JRC)  
OPERATIONAL AMPLIFIER  
-TOP VIEW-



MC14598BCP (MOTOROLA)  
C-MOS 8-BIT BUS-COMPATIBLE THREE-STATE LATCHES  
-TOP VIEW-



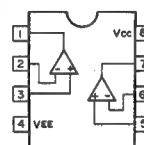
LATCH TRUTH TABLE

CONTROL INPUT	EN	STB	RD	OUTPUT OF ADDRESSED LATCH	OUTPUT OF OTHER LATCHES
1	0	1		NO CHANGE	NO CHANGE
1	1	1		DATA	NO CHANGE
1	X	0		Q	Q
0	X	X		OPEN	OPEN

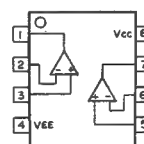
LATCH SELECTION

CONTROL INPUT	A2	A1	A0	ADDRESSED LATCH
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
1	0	0	0	4
1	0	1	0	5
1	1	0	0	6
1	1	1	0	7

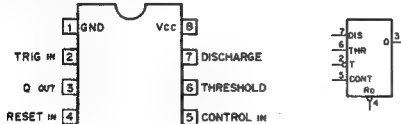
RC4558 (RAYTHEON)  
μPC4558C (NEC)  
NJM4558D (JRC)  
μPC1458C (NEC)  
OPERATIONAL AMPLIFIER  
-TOP VIEW-



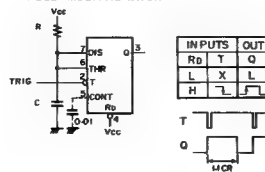
NJM4562D (JRC)  
OPERATIONAL AMPLIFIER  
-TOP VIEW-



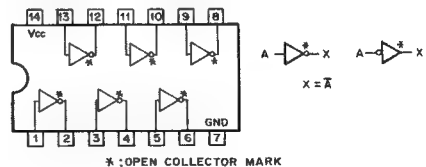
NE555N (SIGNETICS)  
M51841P (MITSUBISHI)  
TIMER  
-TOP VIEW-



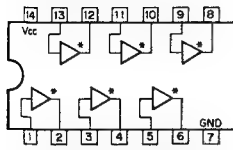
MONOSTABLE MULTIVIBRATOR



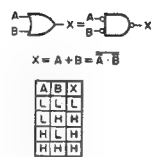
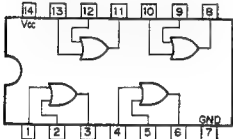
SN74LS05N (TI)  
TTL INVERTER WITH OPEN COLLECTOR  
-TOP VIEW-



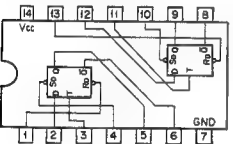
SN7407N (TI)  
TTL BUFFER / DRIVER  
WITH OPEN - COLLECTOR  
— TOP VIEW —



SN74LS32N (TI)  
TTL 2-INPUT POSITIVE - OR GATE  
— TOP VIEW —



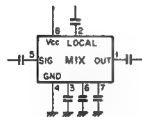
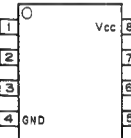
SN74LS74AN (TI)  
TTL D-TYPE FLIP FLOP WITH DIRECT SET/RESET  
— TOP VIEW —



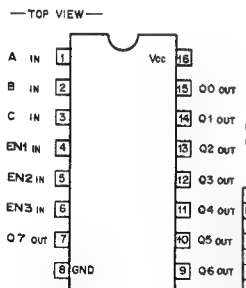
INPUTS		OUTPUTS	
SD	RD	Q	Qn
L	H	X	X
H	L	X	X
L	L	X	X
H	H	X	X
H	L	X	X
L	H	X	X
H	H	X	X

\* UNSTABLE

SN6913P (TI)  
BALANCED MIXER  
— TOP VIEW —

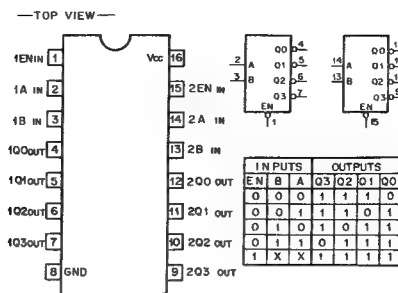


SN74LS138N (TI)  
TTL 3-TO-8-LINE DECODER/DEMULTIPLER  
— TOP VIEW —



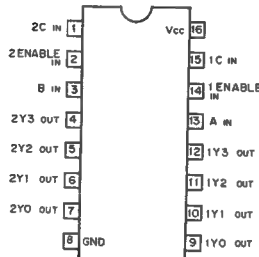
INPUTS			OUTPUTS							
EN	C	B	A	Q0	Q1	Q2	Q3	Q4	Q5	Q6
0	X	X	X	1	1	1	1	1	1	1
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	1	1	1
1	0	1	0	1	1	1	1	1	1	1
1	0	1	1	1	1	1	1	1	1	1
1	1	0	0	1	1	1	1	1	1	1
1	1	0	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	1	1	1	1

SN74LS139N (TI)  
TTL 2-TO-4-LINE DECODER/DEMULTIPLER  
— TOP VIEW —

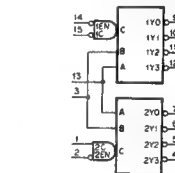


INPUTS		OUTPUTS			
EN	B	A	Q0	Q1	Q2
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	1	1	1
0	1	1	1	1	1
1	X	X	1	1	1

SN74LS156N (TI)  
TTL DUAL 2-LINE-TO-4-LINE DECODER / DEMULTIPLEXER  
(OPEN COLLECTOR OUTPUT)  
— TOP VIEW —



DUAL 2-LINE-TO-4-LINE DECODER  
OR DUAL 1-LINE-TO-4-LINE DEMULTIPLEXER



INPUTS		OUTPUTS			
ENABLE	DATA	SELECT	Y0	Y1	Y2
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	1	1	1
0	1	1	1	1	1
1	X	X	1	1	1

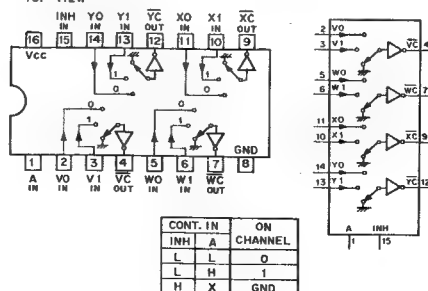
INPUTS		OUTPUTS			
ENABLE	DATA	SELECT	Y0	Y1	Y2
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	1	1	1
0	1	1	1	1	1
1	X	X	1	1	1

3-LINE-TO-8-LINE DECODER  
OR 1-LINE-TO-8-LINE DEMULTIPLEXER



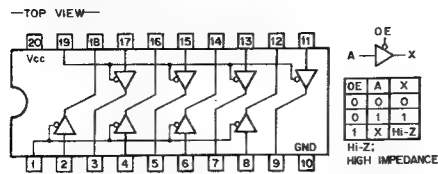
INPUTS		OUTPUTS							
ENABLE/DATA	SELECT	C	B	A	Y0	Y1	Y2	Y3	Y4
0	0	0	0	1	1	1	1	1	1
0	0	0	1	1	1	1	1	1	1
0	0	1	0	1	1	1	1	1	1
0	0	1	1	1	1	1	1	1	1
0	1	0	0	1	1	1	1	1	1
0	1	0	1	1	1	1	1	1	1
0	1	1	0	1	1	1	1	1	1
0	1	1	1	1	1	1	1	1	1

SN74LS158N (TI)  
TTL 2-LINE-TO-1-LINE INVERTED DATA SELECTOR / MULTIPLEXER  
— TOP VIEW —

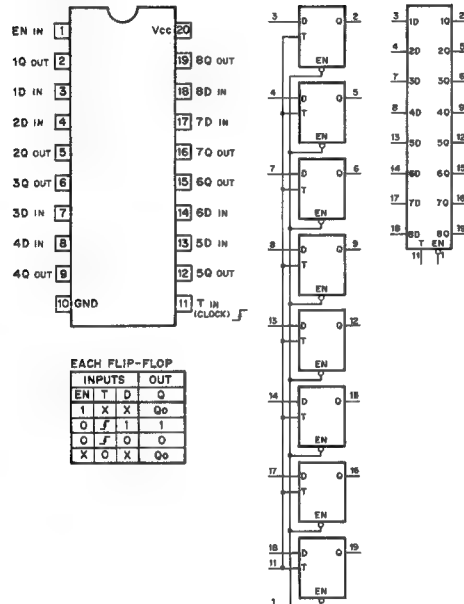


CONT. IN	ON CHANNEL
L	L
L	H
H	X

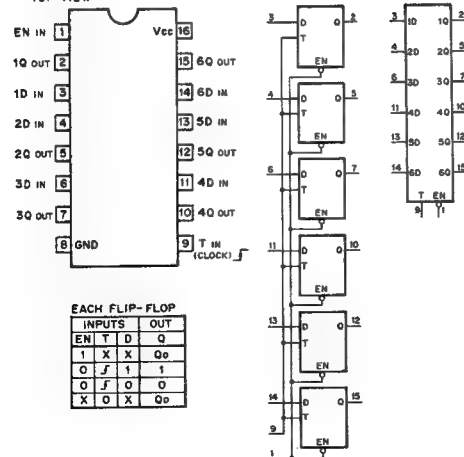
SN74LS244N (TI)  
M74LS244P (MITSUBISHI)  
TTL OCTAL BUFFER/LINE DRIVER  
(3-STATE OUTPUT)



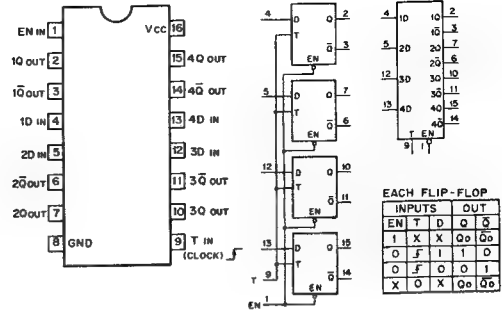
SN74LS377N (TI)  
TTL D-TYPE FLIP-FLOP WITH ENABLE  
—TOP VIEW—



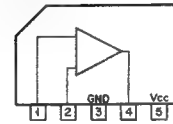
SN74LS378N (TI)  
TTL D-TYPE FLIP-FLOP WITH ENABLE  
—TOP VIEW—



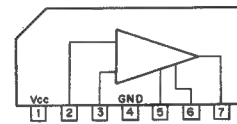
SN74LS379N (TI)  
TTL QUAD D-TYPE FLIP-FLOP WITH ENABLE  
—TOP VIEW—



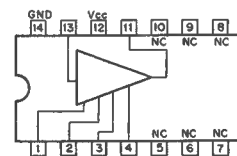
TA7060AP (TOSHIBA)  
TA7060P (TOSHIBA)  
LINEAR AMP  
—SIDE VIEW—



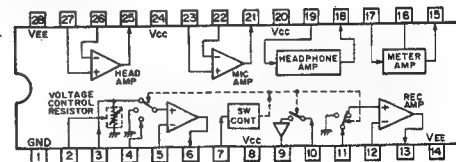
TA7069P (TOSHIBA)  
VIDEO AMPLIFIER  
—SIDE VIEW—



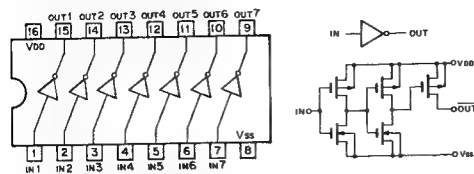
TA7076P (TOSHIBA)  
VIDEO LINEAR AMP  
—TOP VIEW—



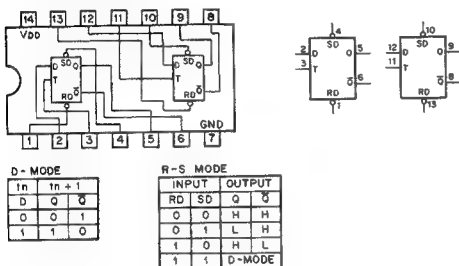
TA7617AP (TOSHIBA)  
AUDIO AMPLIFIER FOR TAPE DECK  
—TOP VIEW—



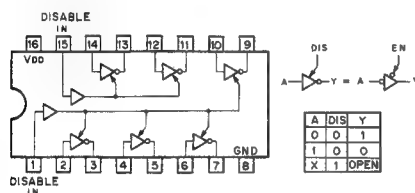
TC5067BP (TOSHIBA)  
C-MOS HIGH VOLTAGE BUFFER/INVERTING TYPE  
— TOP VIEW —



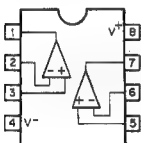
TC40H074P (TOSHIBA)  
C-MOS HIGH SPEED D-TYPE FLIP-FLOP WITH DIRECT SET/RESET  
— TOP VIEW —



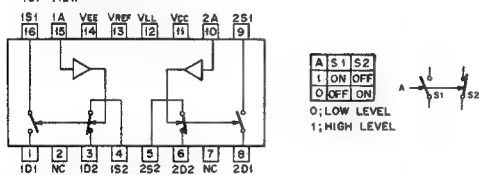
TC40H368P (TOSHIBA)  
C-MOS INVERTING 3-STATE BUFFER  
— TOP VIEW —



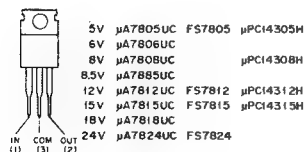
TLO82CP (TI)  
OPERATIONAL AMPLIFIER  
(JFET-INPUT)  
— TOP VIEW —



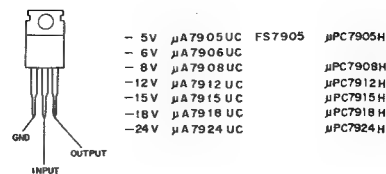
TL191CN (TI)  
TWIN DUAL COMPLEMENTARY  
BI-MOS ANALOG SWITCH  
— TOP VIEW —



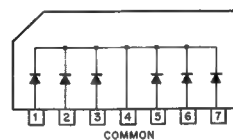
μA7800UC (FSC)  
μPC14300H (NEC)  
μPC7800H (NEC)  
POSITIVE VOLTAGE REGULATOR (1A)



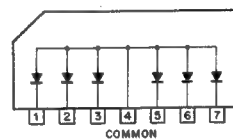
μA7900UC (FSC)  
FS7900 (SANKEN)  
NEGATIVE VOLTAGE REGULATOR (1A)



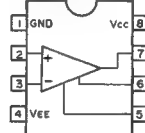
μPA54H (NEC)  
DIODE ARRAY  
— SIDE VIEW —



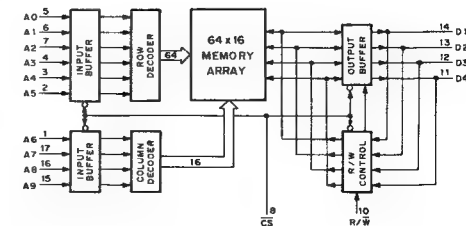
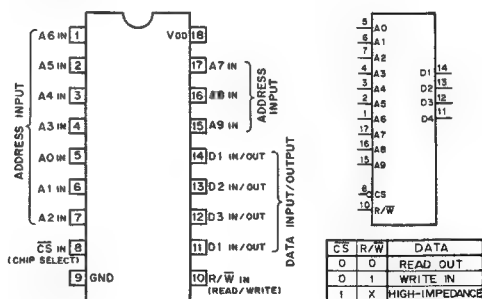
μPA64H (NEC)  
DIODE ARRAY  
— SIDE VIEW —



μPC311C (NEC)  
VOLTAGE COMPARATOR  
— TOP VIEW —



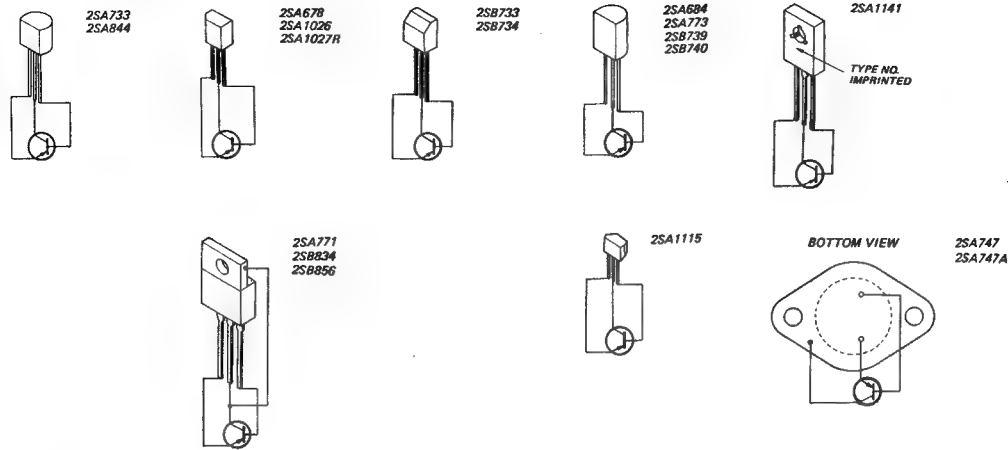
μPD444C (NEC)  
C-MOS 4096-BIT (1024x4) STATIC RAM  
— TOP VIEW —



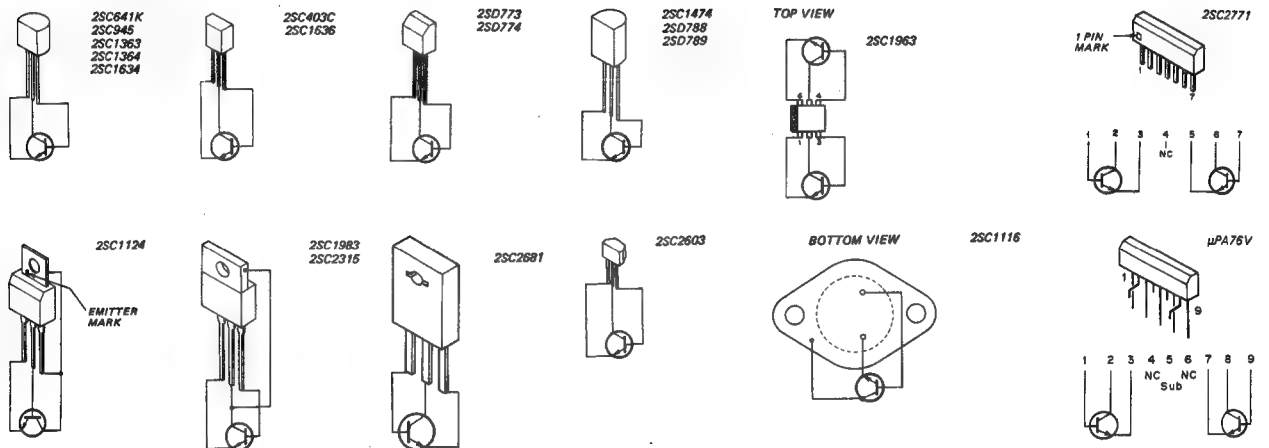


# TR (PNP, NPN, FET), LED

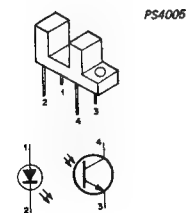
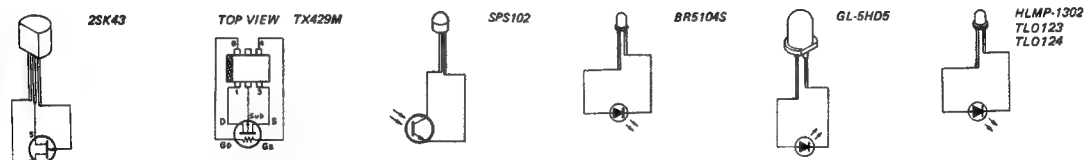
## (2SA\*\*\*, 2SB\*\*\*)



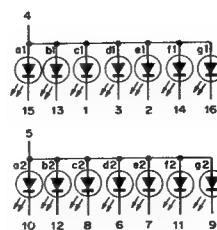
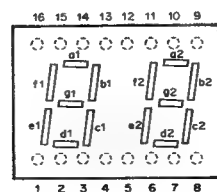
## (2SC\*\*\*, 2SD\*\*\*)

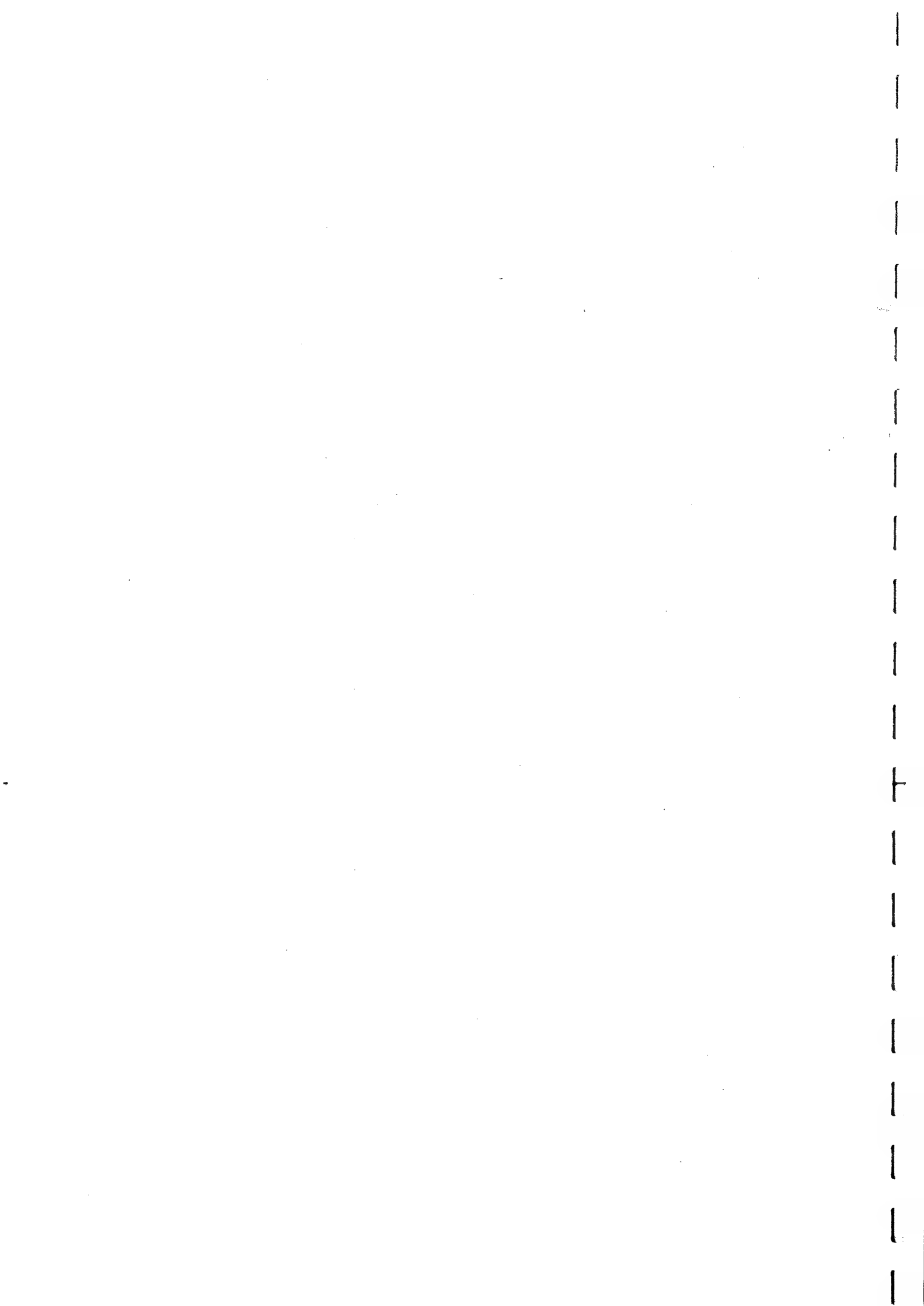


## (OTHER)



TLR321 (TOSHIBA)  
DUAL 7-SEGMENT LED  
—TOP VIEW—





## SECTION 17

### PRINTED CIRCUIT BOARD AND SCHEMATIC DIAGRAM

#### 17-1. CIRCUIT FUNCTION OF THE PRINTED CIRCUIT BOARD

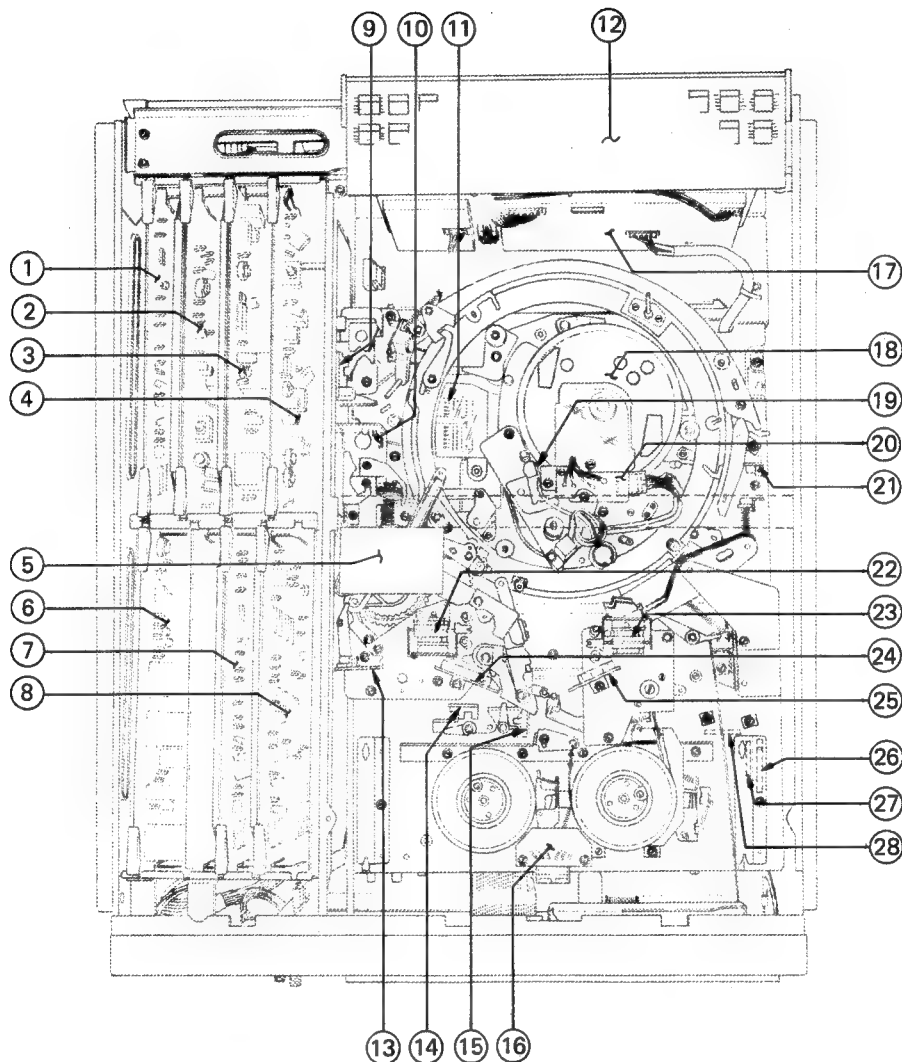
The circuit board information is provided below.

System	Circuit board	Circuit function
VIDEO	MD-15	• Luminance and chrominance signal modulator.
	RP-10	• REC/PB amplifier • Rotary erase amplifier
	DA-6	• DT head amplifier
	YD-10	• Luminance signal demodulator
	CD-18	• Chrominance signal demodulator
AUDIO	AU-13	• REC/PB amplifier • Audio system control
	AU-25	• Bias oscillator • CH-1/CH-2 erase oscillator
	SA-9	• Input impedance converter (high $\leftrightarrow$ low)
	AO-2	• Audio monitor switch
	AO-3	• CH-1/CH-2 output amplifier • Monitor out selector/output amplifier
	HP-5	• Headphones level adj.
SERVO	SV-24	• Capstan/drum speed and phase servo
	CF-8	• CTL REC/PB amplifier
	RS-3 (RS-4)	• Tape tension detector • Reel motor driver control
	EM-1	• Reel rotation detector
	MD-15	• Blanking switcher
	FC-10	• When the set is put into the TBC mode and DT mode simultaneously, this circuit delays the switching pulse.
DYNAMIC TRACKING	DT-3	• Dynamic tracking
TIME CODE	TC-13	• Time code REC/PB amplifier • Automatic reference sync selector (for servo) • CTL counter (for display)
SYSTEM CONTROL	SY-36 or SY-92	• Function control
	SY-37	• System control micro processor
	SY-71	• Cassette compartment motor driver • Threading motor driver • Skew solenoid driver • Pinch solenoid driver • T brake solenoid driver • S brake solenoid driver • S tension regulator solenoid driver • Humidity detector
	KY-9 (KY-14)	• Key board with serial data $\leftrightarrow$ parallel data converter
	DP-9	• Display
	PC-9	• Search dial
	PC-14	• Search dial
POWER DRIVER	PD-19 (PD-15, PD-17) (DR-9, DR-19)	• Full erase oscillator • 12 V regulator • 5 V regulator • -12 V regulator • Drum motor power driver • Capstan motor power driver • Reel motor power driver • Dynamic tracking driver
POWER SUPPLY	PW-50	• Power supply
	PW-79	• Switching regulator
	FU-13	• Fuse

# LOCATION OF PCB

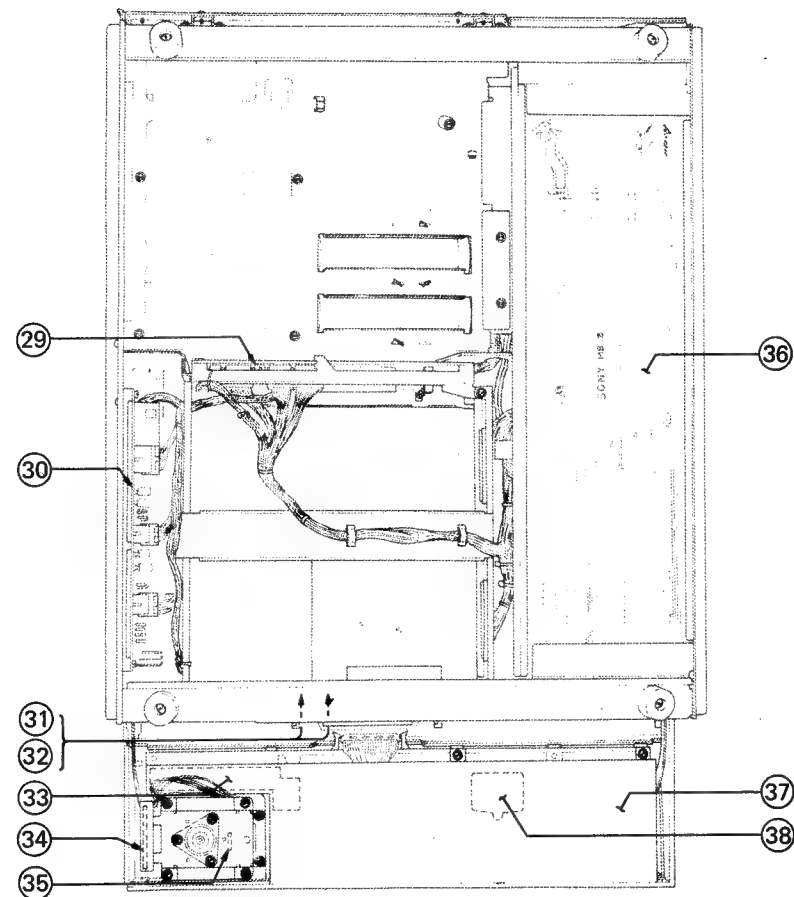
## 17-2. LOCATION OF THE PRINTED CIRCUIT BOARD

< TOP VIEW >



# LOCATION OF PCB LOCATION OF PCB

< BOTTOM VIEW >



AO-2	39
AO-3	57
AU-13 (AU-25)	6
CC-9	26
CC-10	28
CC-11	27
CD-18 (DL-1)	2
DA-6	18
DP-9	33
DT-3	12
EK-2 (A)	13
EK-2 (B)	21
EK-3	9
EM-1	16

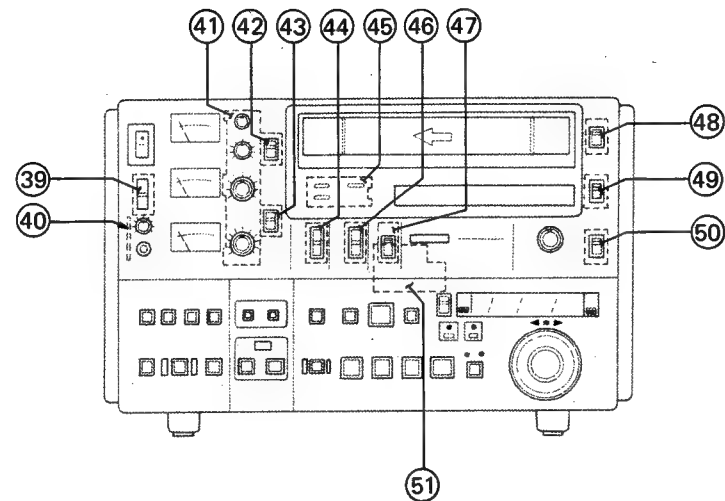
FC-10	5
FU-13	55
HP-5	40
KY-9	37
KY-14	38
LE-4 (A)	23
LE-4 (B)	22
LV-1	42
MB-9	29
MB-36	36
MD-15	4
MF-1	41
MS-5 (A)	43

MS-5 (B)	44
MS-5 (C)	46
MS-5 (D)	47
MS-5 (E)	48
MS-5 (F)	49
PC-7 (A)	15
PC-7 (B)	14
PC-8	25
PC-9	34
PC-12	24
PC-14	35
PD-19 (PD-15, PD-17, PD-21, DR-19, DR-9, BP-6)	53

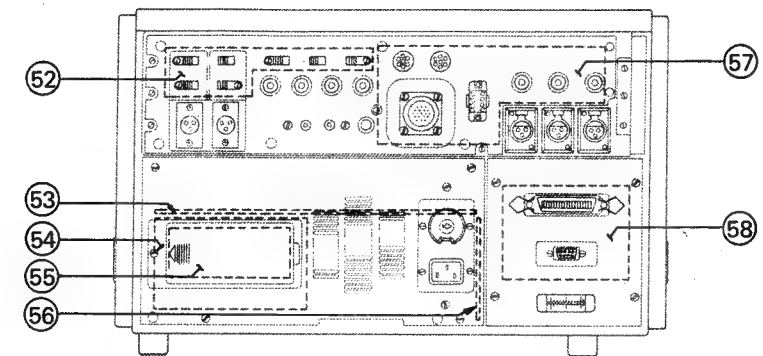
PH-1 (A)	23
PH-1 (B)	22
PR-33	50
PW-50	56
PW-79	54
RE-3	51
RM-4	58
RP-10	17
RS-3 (RS-4)	7
SA-9	52
SR-17	20
SV-24 (CF-8)	8
SY-36 or SY-92	31

SY-37	32
SY-71	30
TC-12	19
TC-13	1
TM-4	11
TM-8	10
WL-1	45
YD-10	3

< FRONT VIEW >

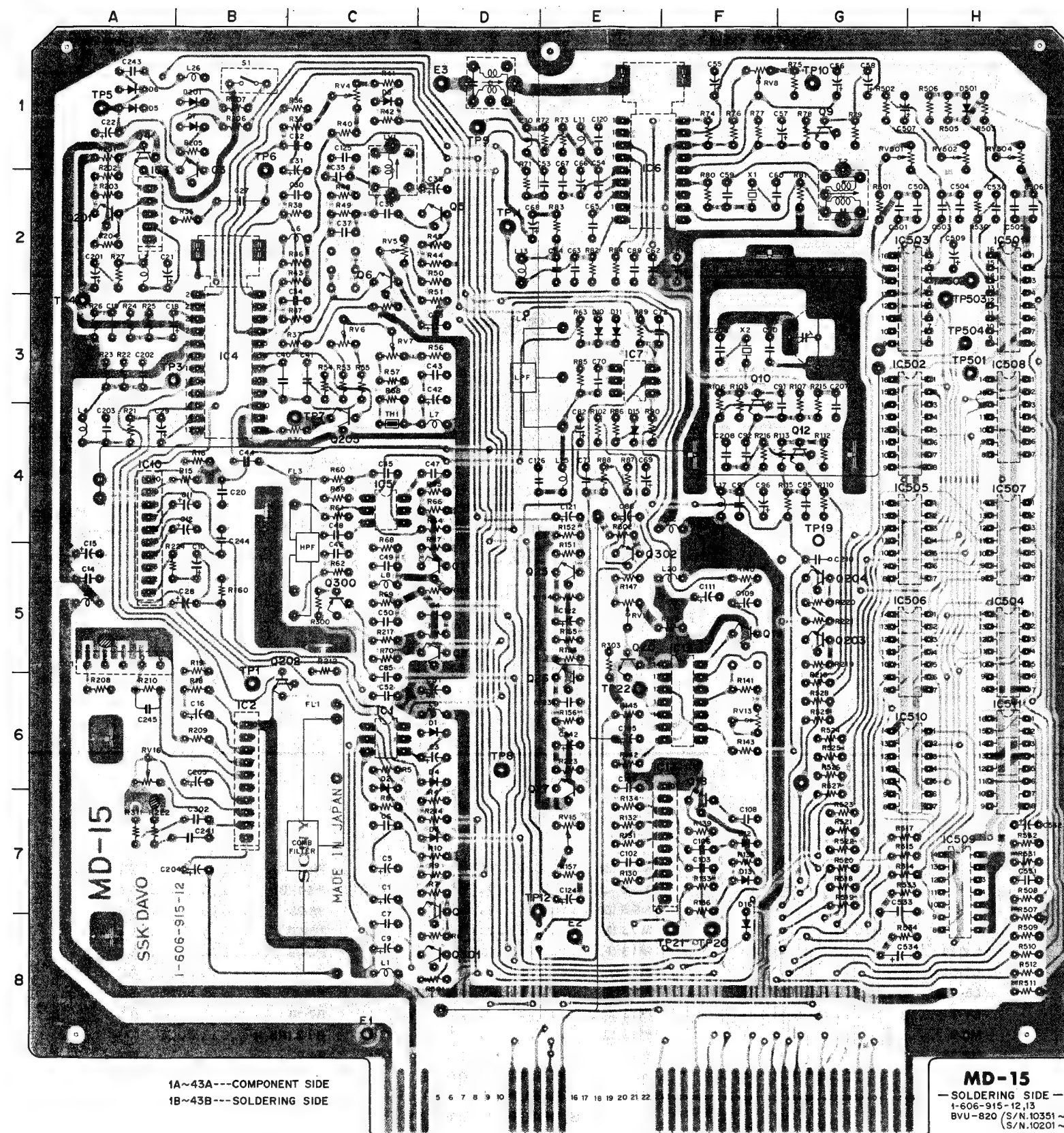


< REAR VIEW >



MD-15 (Y/C MODULATOR)  
(BLANKING SWITCHER)

Serial No. 10351 and higher (U/C)  
Serial No. 10201 and higher (J)



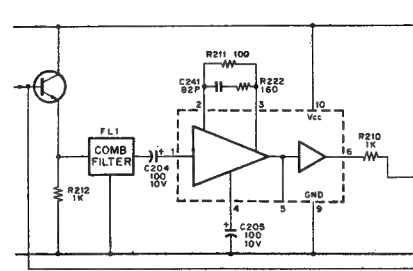
CV1	G-3	S1	B-1
D1	D-6	T1	D-1
D2	C-6	T2	G-2
D3	D-7		
D4	D-6	TP1	B-6
D5	A-1	TP3	A-3
D6	A-1	TP4	A-3
D7	B-1	TP5	A-1
D8	C-1	TP6	B-1
D10	E-3	TP7	C-4
D11	E-3	TP8	D-6
D12	F-7	TP9	D-1
D13	F-7	TP10	G-1
D15	E-4	TP11	D-2
D16	F-8	TP12	D-7
D201	B-1	TP19	G-4
D501	H-1	TP20	F-8
		TP21	F-8
DL1	A-5	TP22	E-6
E1	C-8	TP501	H-3
E2	E-8	TP502	H-2
E3	D-1	TP503	H-3
		TP504	H-3
FL1	C-7	X1	F-2
FL3	C-5	X2	F-3
FL4	D-3		
IC1	C-6		
IC2	B-6		
IC3	A-2		
IC4	B-3		
IC5	C-4		
IC6	E-1		
IC7	E-3		
IC10	A-4		
IC12	F-7		
IC13	F-6		
IC501	H-3		
IC502	H-4		
IC503	H-3		
IC504	H-5		
IC505	H-4		
IC506	H-5		
IC507	H-4		
IC508	H-4		
IC509	H-7		
IC510	H-6		
IC511	H-6		
LV1	C-2		
Q1	D-7		
Q3	B-1		
Q4	A-1		
Q5	D-2		
Q6	C-2		
Q7	D-5		
Q8	D-5		
Q9	G-1		
Q10	F-4		
Q12	G-4		
Q18	F-7		
Q19	F-5		
Q20	E-5		
Q25	E-5		
Q26	E-6		
Q27	E-6		
Q201	A-2		
Q202	B-6		
Q203	G-5		
Q204	G-5		
Q205	C-4		
Q300	C-5		
Q301	D-8		
Q302	E-5		
RV4	C-1		
RV5	C-2		
RV6	C-3		
RV7	C-3		
RV8	F-1		
RV13	F-6		
RV14	E-5		
RV15	E-7		
RV16	A-6		
RV501	G-1		
RV502	H-1		
RV504	H-1		

**MD-15 (Y/C MODULATOR)  
(BLANKING SWITCHER)**

MARK	CHANGE INFORMATION	SERIAL NO.
※ 1	C244 240P → 100P C533 C534 0.47/16V → 0.047 R533 R534 1K → 10K	10351 ~ (U/C) 10201 ~ (J)
※ 2	RV504 220K → 470K	10646 ~ (U/C) 10201 ~ (J)
※ 3	C245 33P ADD (ADJUSTABLE)	10746 ~ (U/C) 10251 ~ (J)

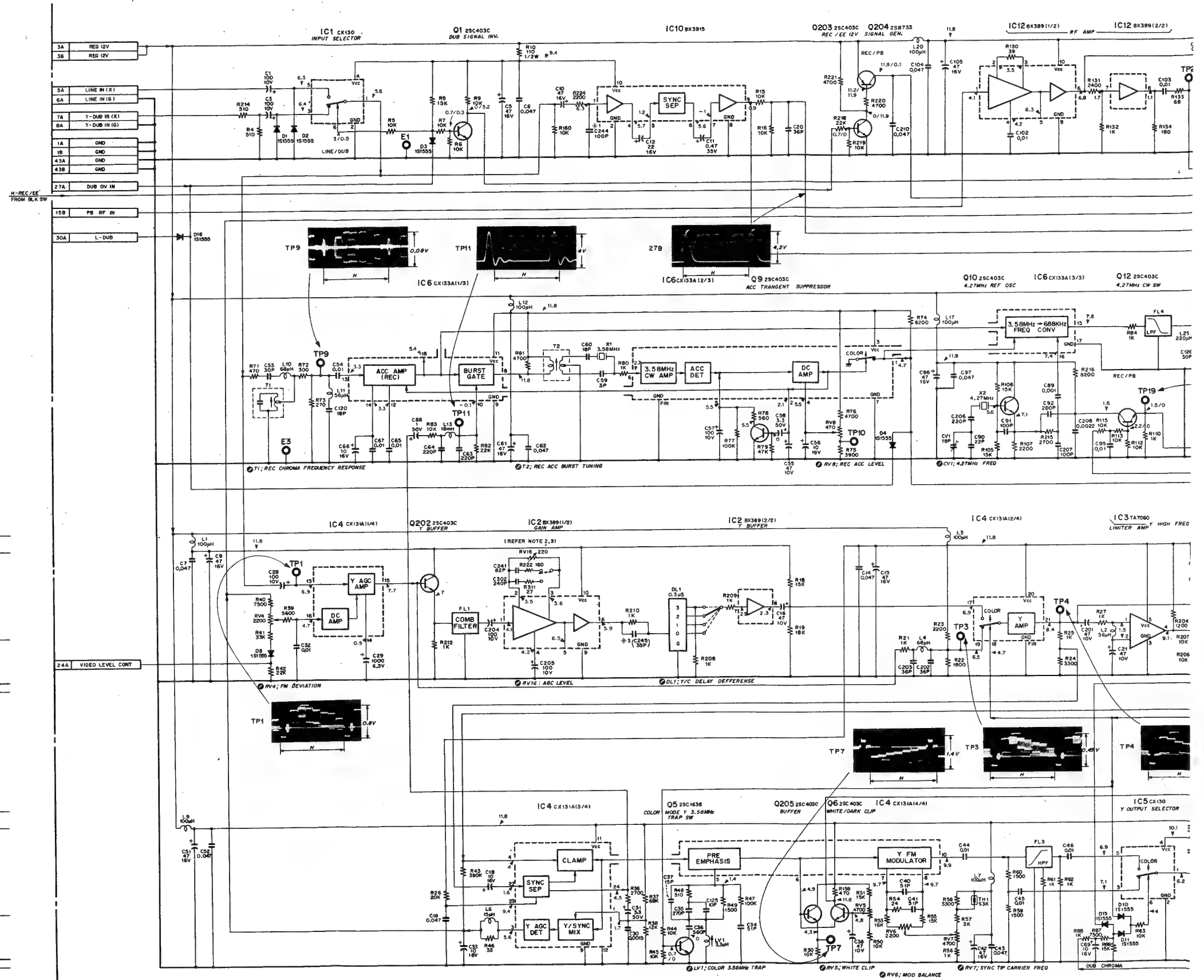
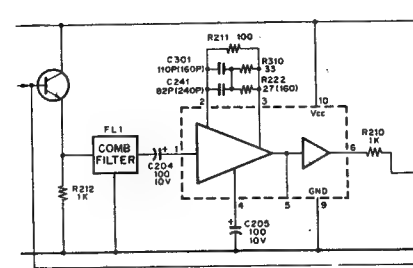
NOTE:2  
(S/N. 10001 ~ 10030 (U/C))  
(S/N. 10001 ~ 10020 (J))

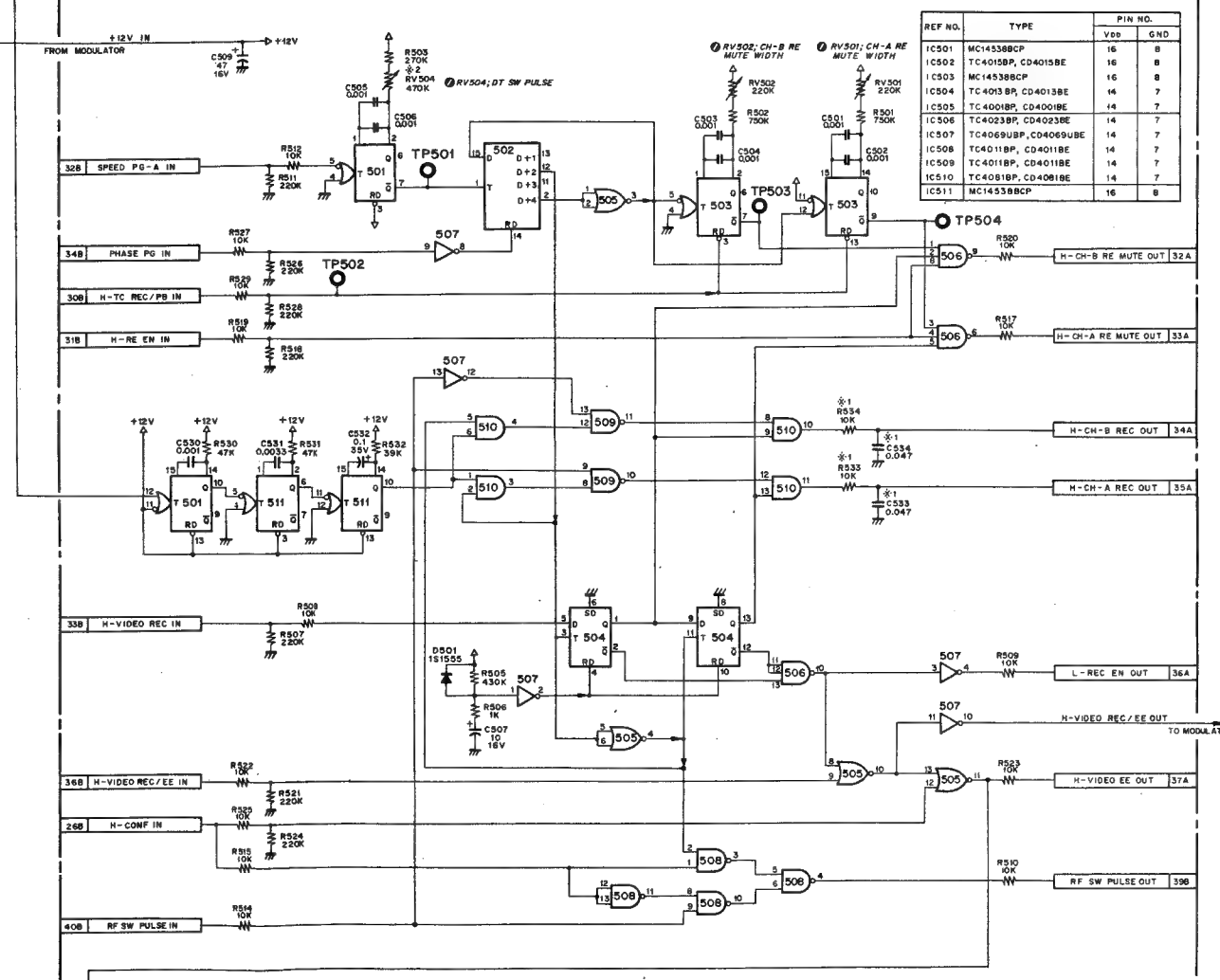
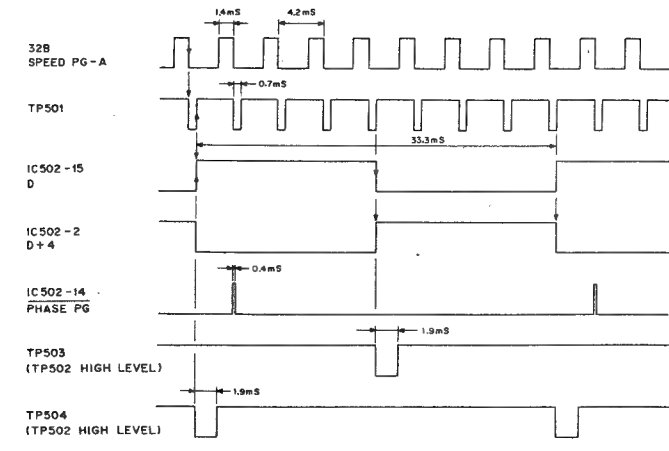
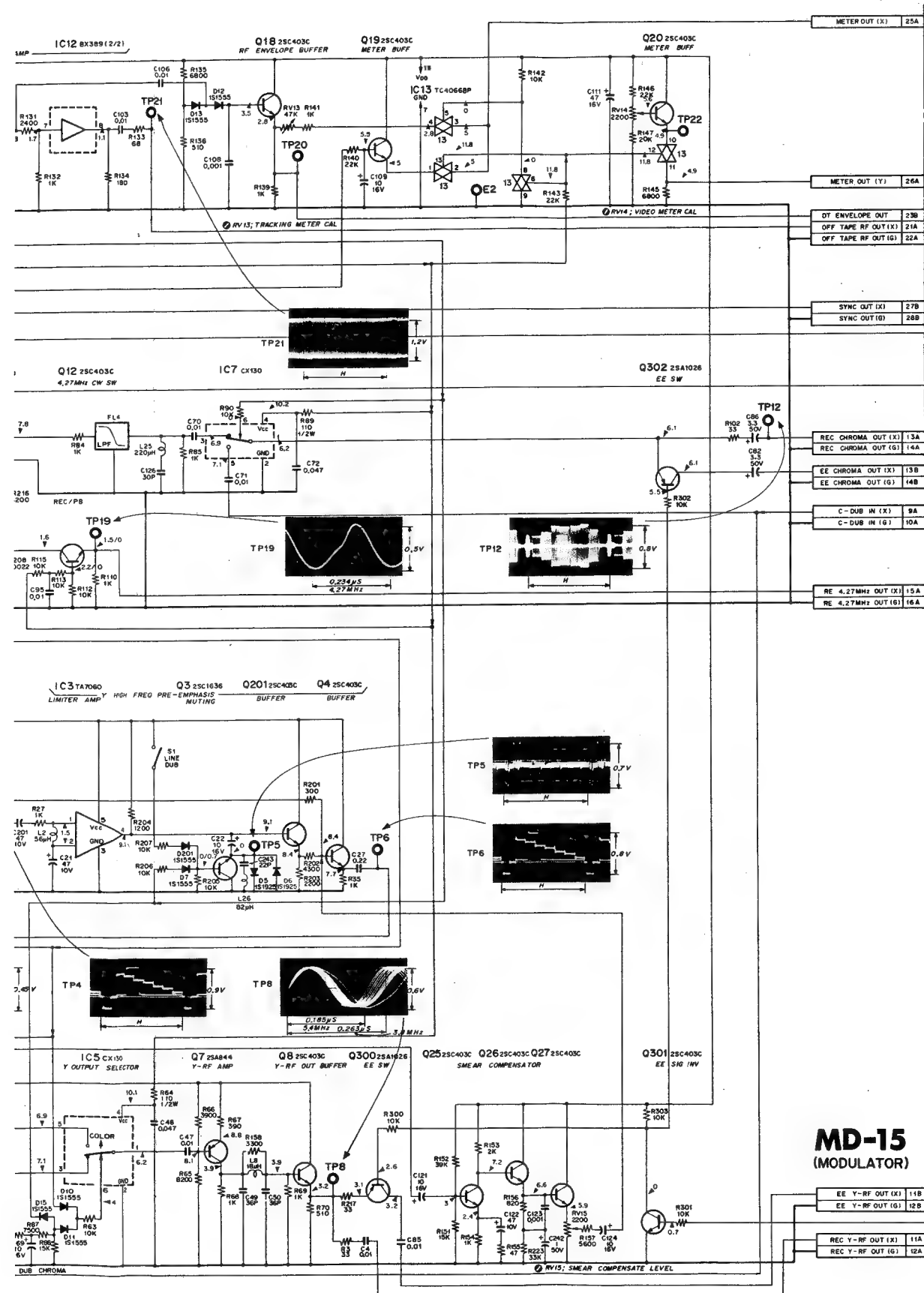
Q202 25C403C  
Y BUFFER



NOTE:3  
(S/N. 10031 ~ 10350 (U/C))  
(S/N. 10021 ~ 10200 (J))

Q202 2SC403C  
Y BUFFER



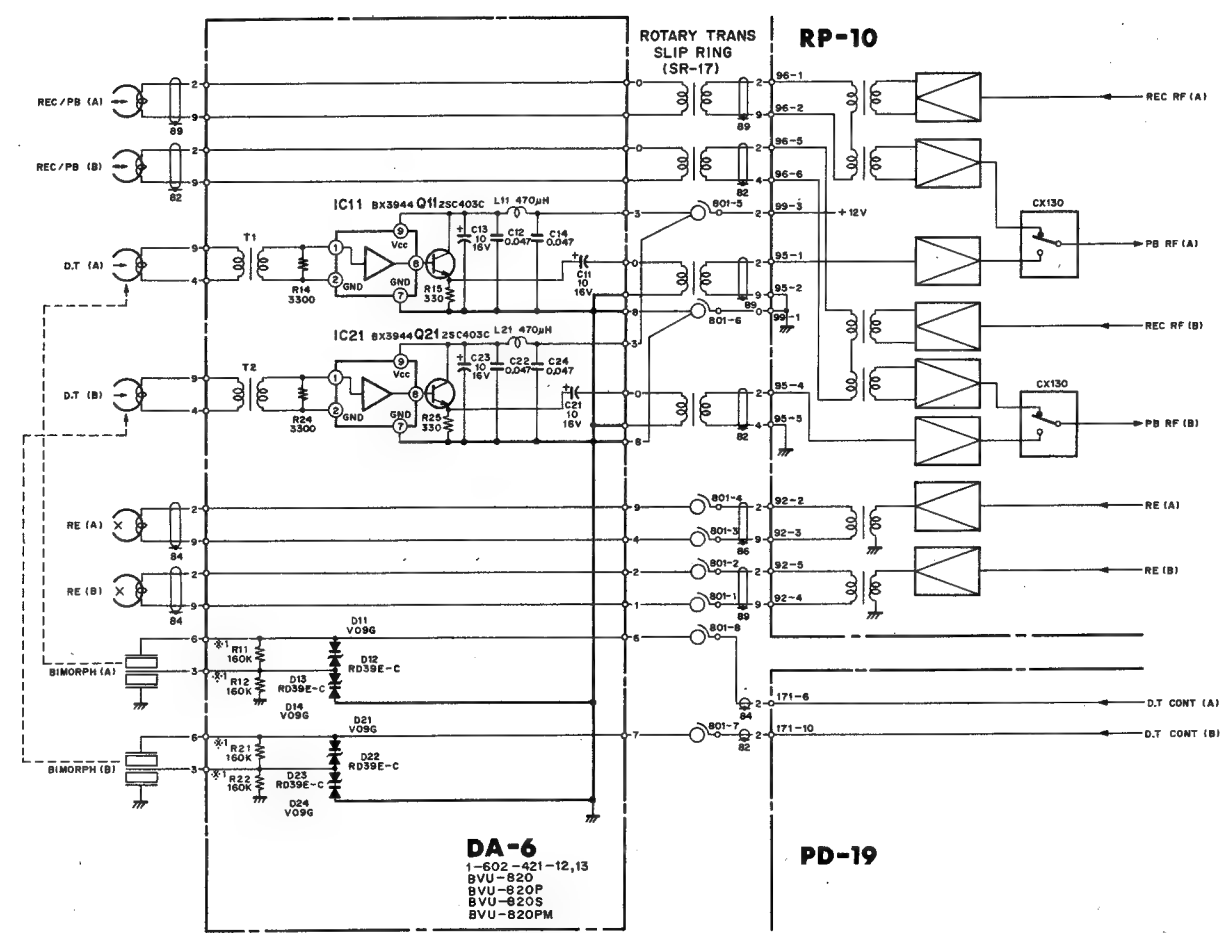




DA-6 (DT HEAD AMPLIFIER)

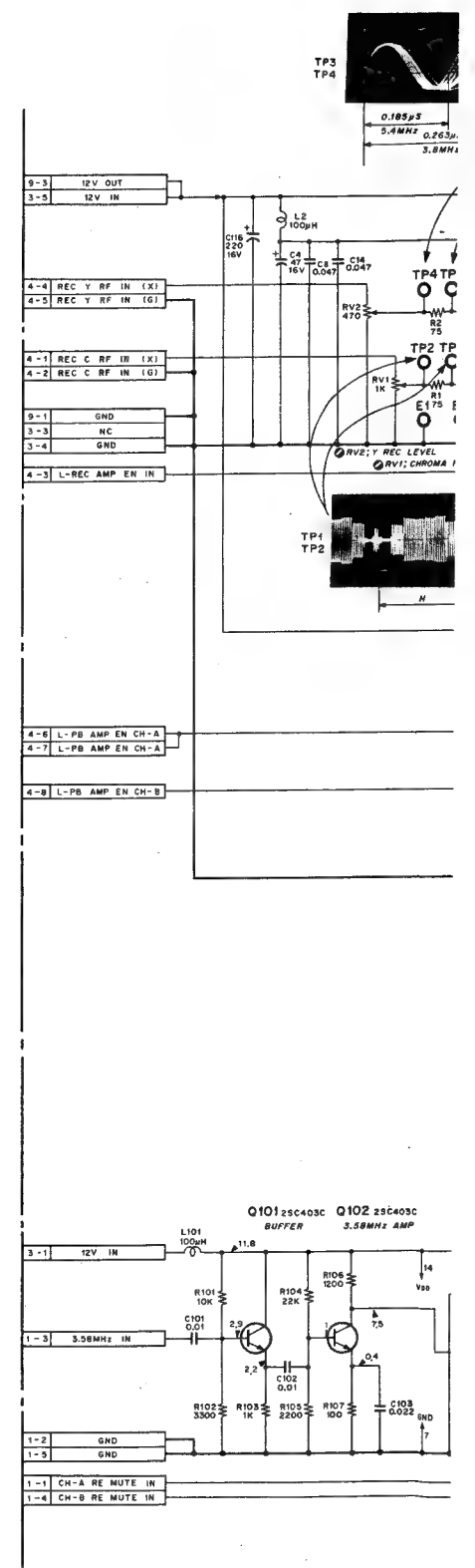
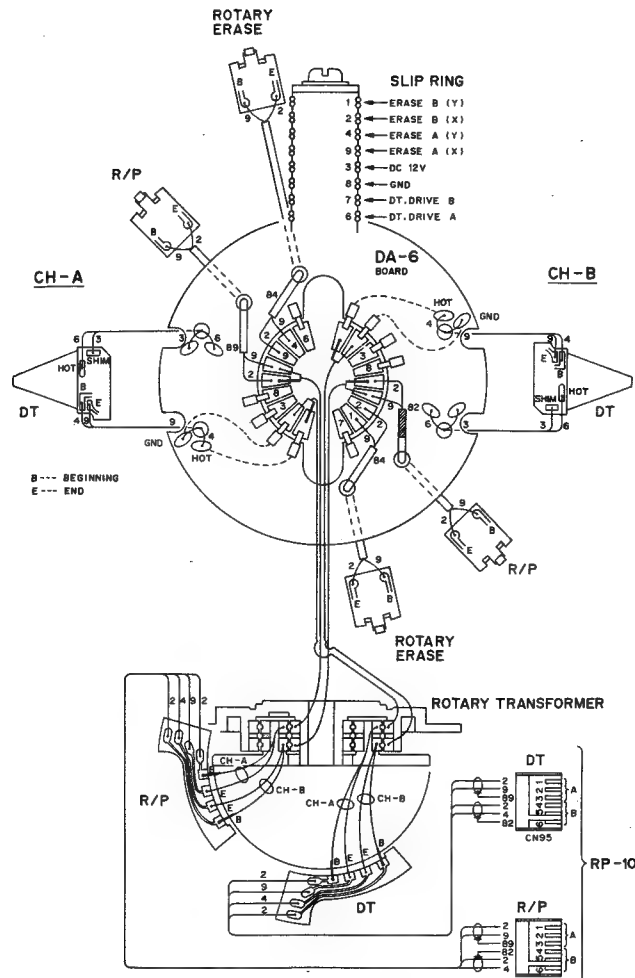
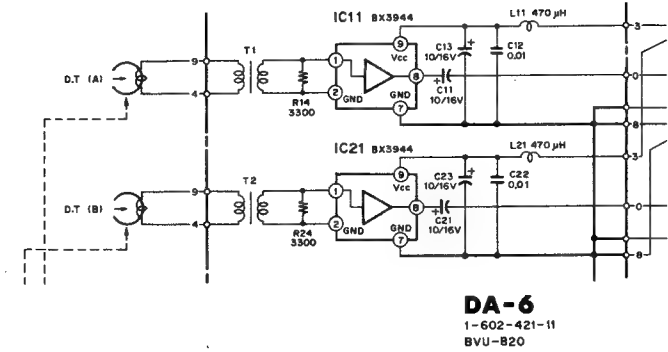
RP-10 (Y/C REC PB AMPLIFIER)  
(ROTARY ERASE AMPLIFIER)

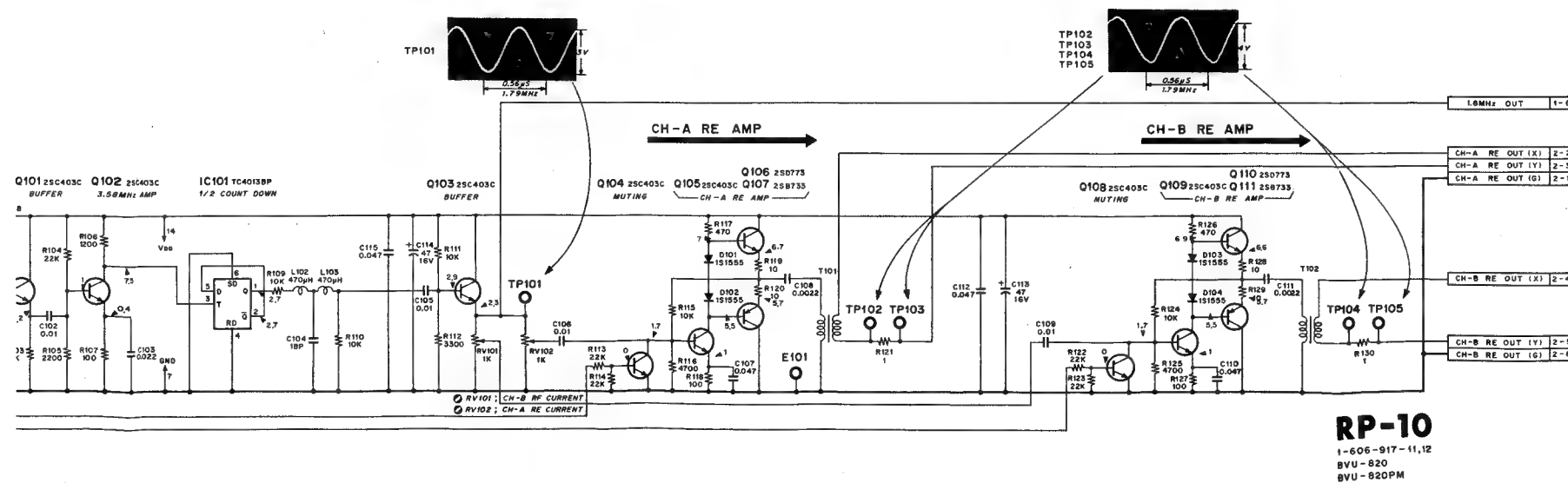
Serial No. 10021 and higher (J)  
Serial No. 10031 and higher (U/C)



MARK	CHANGE INFORMATION	SERIAL NO.
1	R11, 12 160K ADDED R21, 22	U/C: 10151 ~ J: 10101 ~ P: 10031 ~ S: 10001 ~ PM: 10001 ~

Serial No. 10001 to 10020 (J)  
Serial No. 10001 to 10030 (U/C)





1-606-917-11,12  
BVU-820  
BVU-820PM

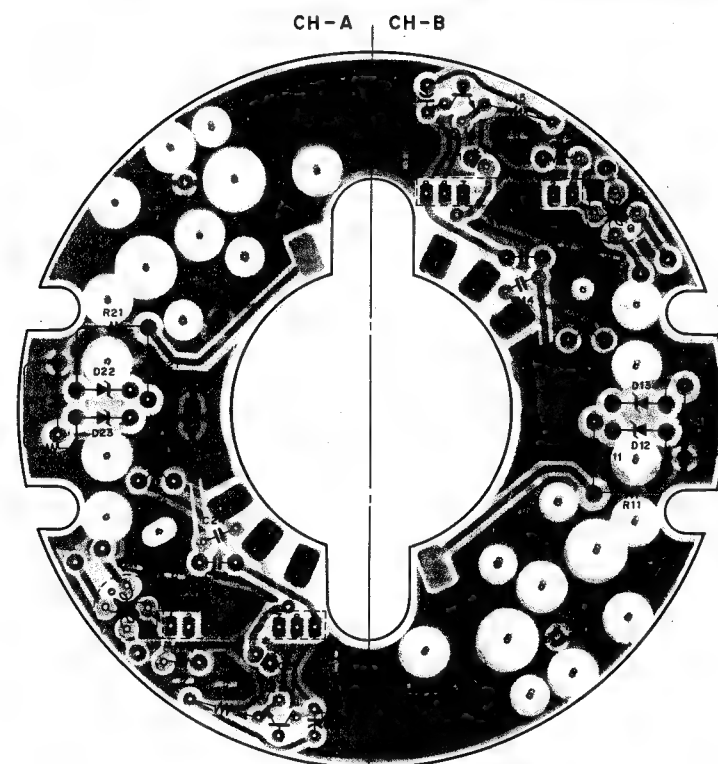
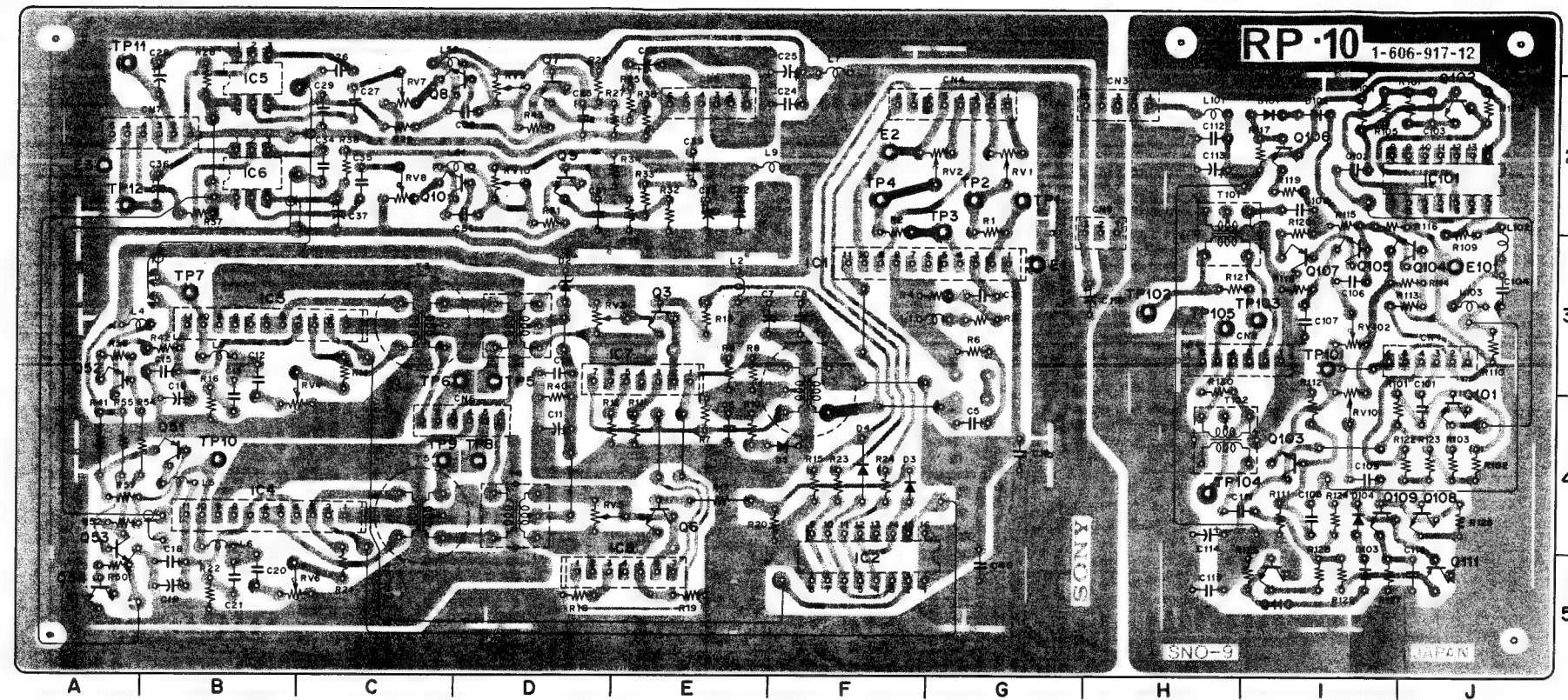
MARK	CHANGE INFORMATION	SERIAL NO.
① 1	R37 10K → 220	10896 ~ 11505 (U/ 10351 ~ 10480 (J) 10006 ~ 10021 (PM

RP-10 (Y/C REC PB AMPLIFIER)  
(ROTARY ERASE AMPLIFIER)

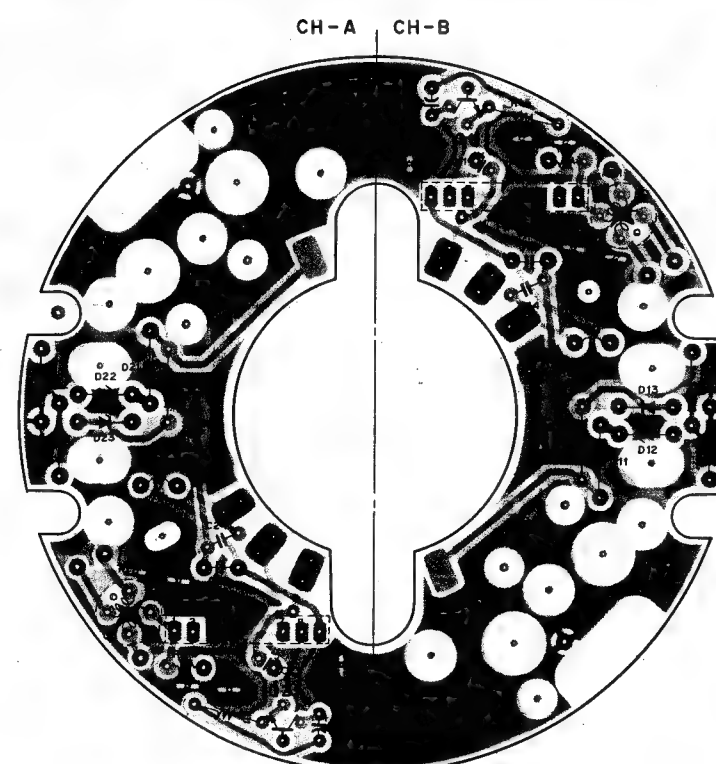
Serial No. 10021 and higher (J)  
Serial No. 10081 and higher (U/C)

DA-6 (DT HEAD AMPLIFIER)

Serial No. 10021 and higher (J)  
Serial No. 10031 and higher (U/C)



**DA-6**  
-COMPONENT SIDE-  
1-602-421-12  
BVU-820 (S/N.10081~10645 (U/C))  
(S/N.10021~10200 (J))  
BVU-820P (S/N.~10250)  
BVU-820S (S/N.~10050)  
BVU-820PM (S/N.~10005)



**DA-6**  
-COMPONENT SIDE-  
1-602-421-13  
BVU-820 (S/N.10646~(U/C))  
(S/N.10201~(J))  
BVU-820P (S/N.10251~)  
BVU-820S (S/N.10051~)  
BVU-820PM (S/N.10006~)

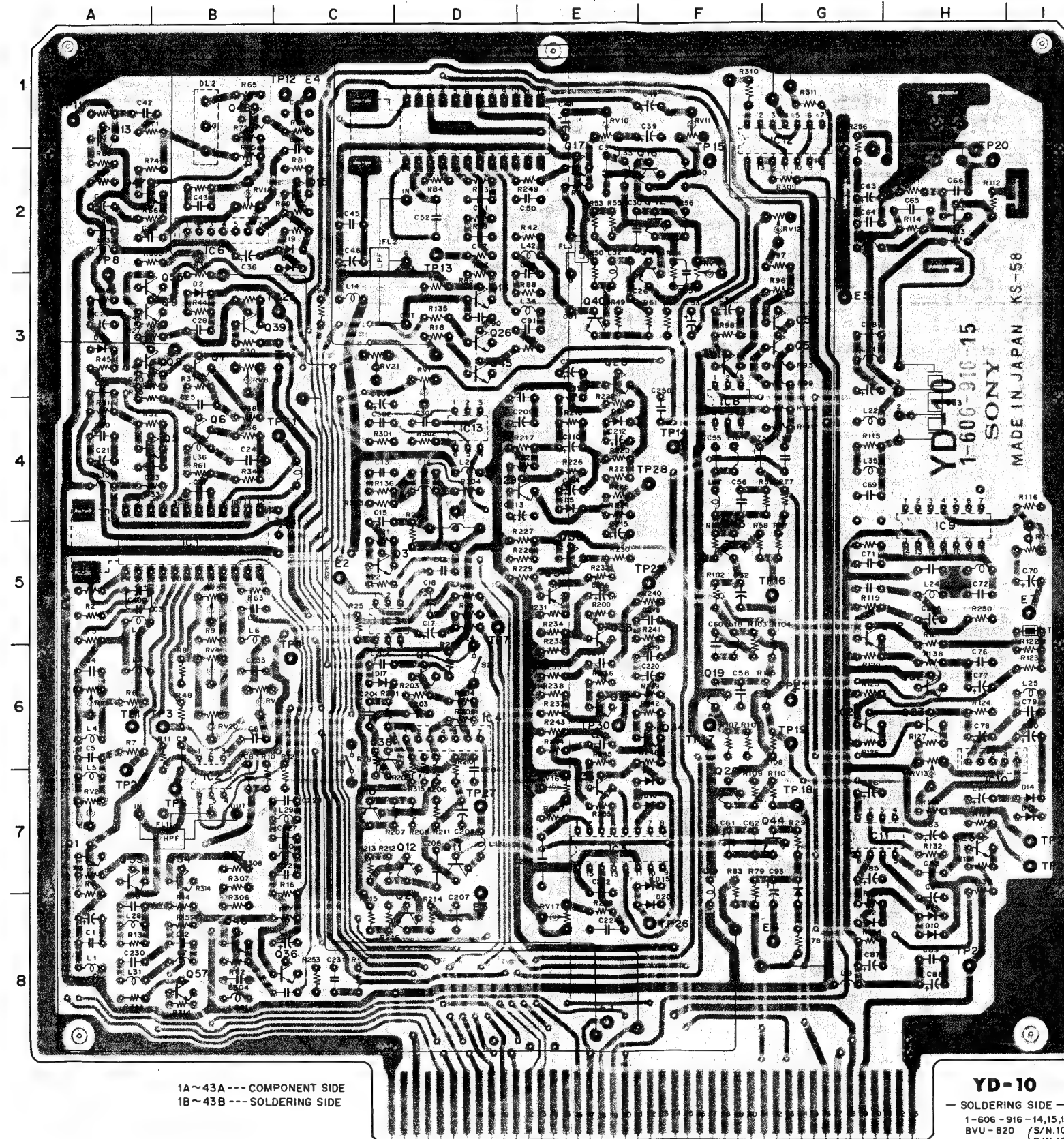
**RP-10-SOLDERING SIDE-**  
1-606-917-12

CN1 J-3	RV1 G-2	T1 F-3
CN2 I-3	RV2 G-2	T2 D-3
CN3 H-2	RV3 E-3	T3 C-3
CN4 G-2	RV4 C-3	T4 D-4
CN5 E-2	RV5 E-4	T5 C-4
CN6 D-4	RV6 C-5	T101 H-3
CN7 B-2	RV7 C-2	T102 H-4
CN9 H-3	RV8 C-2	
	RV9 D-2	TP1 G-2
D1 F-4	RV10 D-2	TP2 G-2
D2 D-3	RV101 I-4	TP3 G-3
D3 F-4	RV102 I-3	TP4 F-2
D4 F-4		TP5 D-3
D101 I-2	Q3 E-3	TP6 D-3
D102 I-2	Q6 E-4	TP7 B-3
D103 I-5	Q7 D-2	TP8 D-4
D104 I-4	Q8 D-2	TP9 C-4
	Q9 D-2	TP10 B-4
E1 G-3	Q10 D-2	TP11 A-1
E2 F-2	Q51 B-4	TP12 A-2
E3 A-2	Q52 A-3	TP101 I-3
E101 J-3	Q53 A-5	TP102 H-3
	Q54 A-5	TP103 I-3
IC1 G-3	Q101 J-4	TP104 H-4
IC2 F-5	Q102 J-2	TP105 H-3
IC3 B-3	Q103 I-4	
IC4 B-4	Q104 J-3	
IC5 B-2	Q105 I-3	
IC6 B-2	Q106 I-2	
IC7 E-3	Q107 I-3	
IC8 E-5	Q108 J-4	
IC101 J-2	Q109 I-4	
	Q110 I-5	
	Q111 J-5	



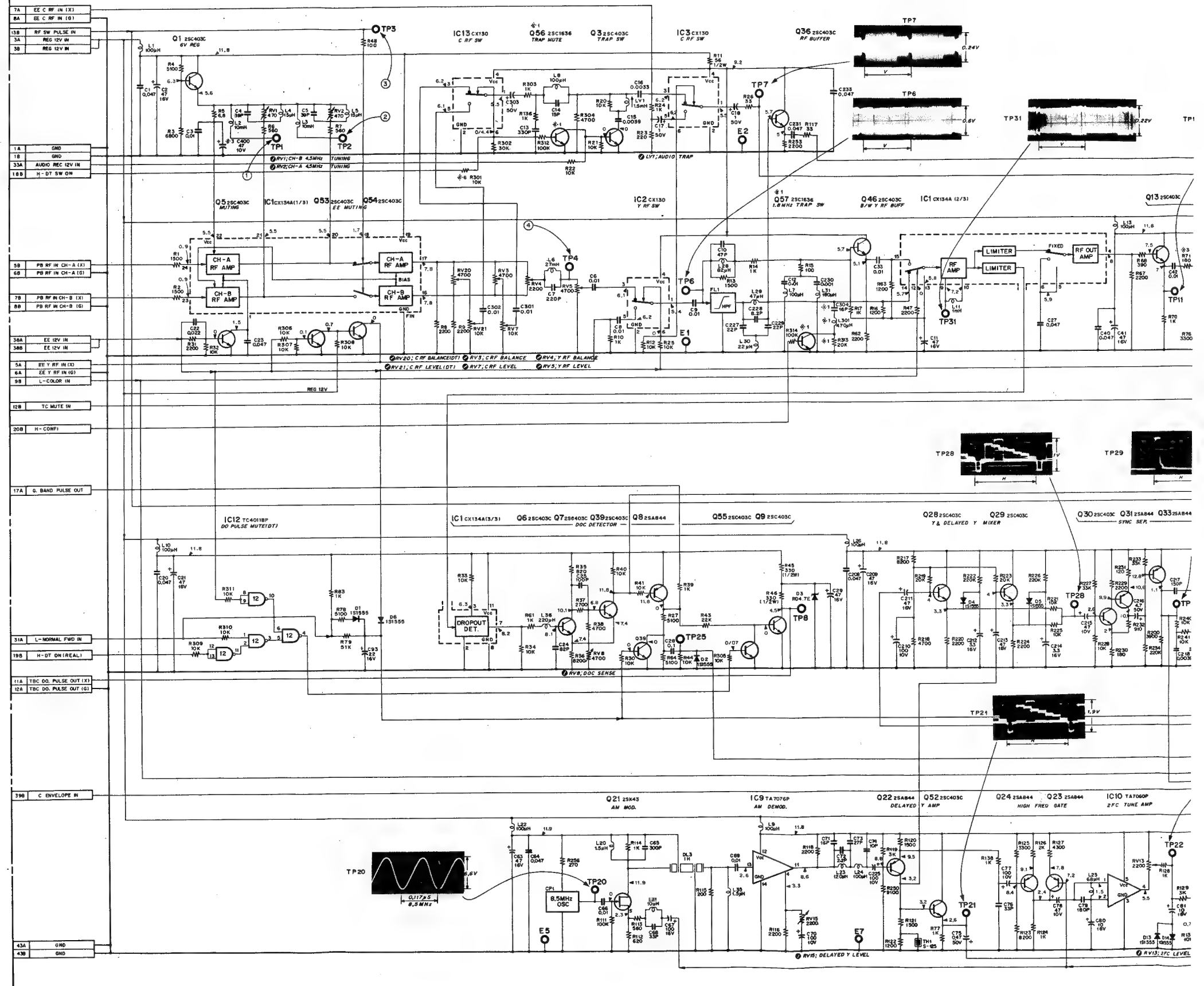
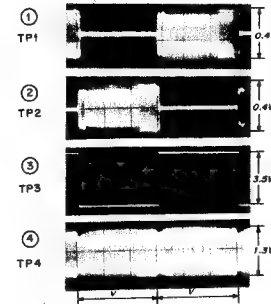
YD-10 (Y DEMODULATOR)

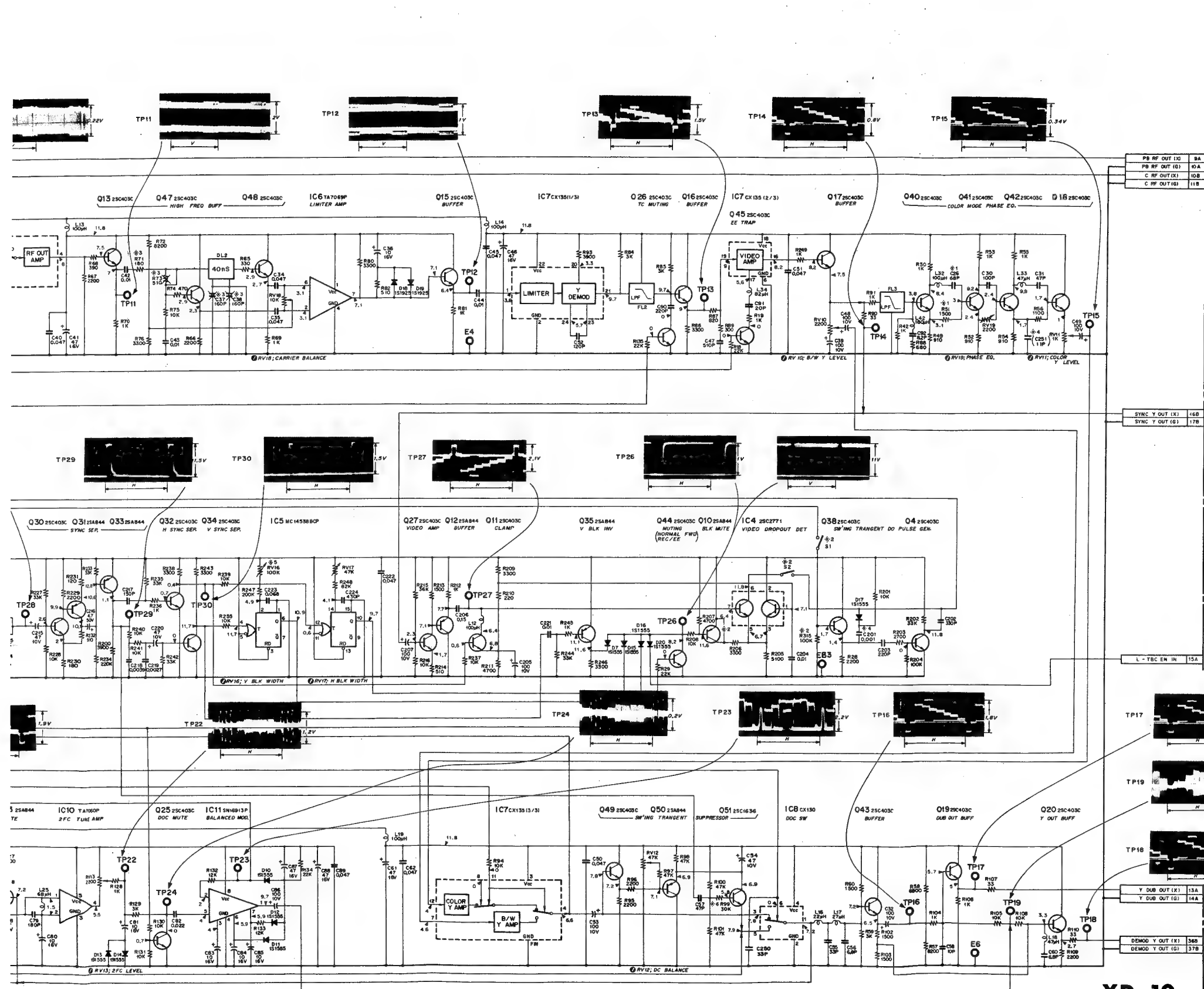
Serial No. 10551 and higher (U/C)  
Serial No. 10201 and higher (J)



CP1	H-1	Q41	F-3
D1	G-8	Q42	F-2
D2	B-3	Q43	F-6
D3	A-3	Q44	G-7
D4	E-4	Q45	D-3
D5	E-4	Q46	B-8
D6	C-3	Q47	B-2
D7	F-7	Q48	B-1
D10	H-8	Q49	F-3
D11	H-8	Q50	G-3
D12	G-8	Q51	G-3
D13	I-7	Q52	H-8
D14	I-7	Q53	A-7
D15	F-7	Q54	B-7
D16	F-7	Q55	B-3
D17	C-6	Q57	B-8
D18	C-2		
D19	C-2	RV1	A-6
D20	F-8	RV2	A-7
DL2	B-1	RV3	B-5
DL3	H-3	RV4	B-6
		RV5	B-6
		RV7	D-3
E1	E-8	RV8	B-3
E2	C-5	RV10	E-1
E3	D-8	RV11	F-1
E4	C-1	RV12	G-2
E5	G-3	RV13	H-7
E6	G-8	RV15	I-5
E7	I-5	RV16	E-7
		RV17	E-8
FL1	B-7	RV18	B-2
FL2	C-2	RV19	F-2
FL3	E-2	RV20	B-6
		RV21	C-3
IC1	B-5	S1	C-6
IC2	B-7	S2	D-6
IC3	C-5		
IC4	D-6	TP1	A-6
IC5	E-7	TP2	A-6
IC6	B-2	TP3	B-6
IC7	D-1	TP4	C-6
IC8	F-4	TP6	B-7
IC9	H-5	TP7	D-5
IC10	H-6	TP8	A-2
IC11	G-7	TP11	A-1
IC12	G-1	TP12	C-1
IC13	D-4	TP13	D-2
		TP14	F-4
LV1	D-5	TP15	F-2
		TP16	G-5
Q1	A-7	TP17	F-6
Q3	C-5	TP18	G-7
Q4	D-6	TP19	G-6
Q5	A-4	TP20	H-2
Q6	B-4	TP21	G-6
Q7	B-3	TP22	I-7
Q8	B-3	TP23	H-8
Q9	B-3	TP24	I-7
Q10	C-7	TP25	C-3
Q11	D-7	TP26	F-8
Q12	D-7	TP27	D-7
Q13	A-1	TP28	F-4
Q15	C-2	TP29	F-6
Q16	D-3	TP30	F-6
Q17	E-2	TP31	C-4
Q18	F-2		
Q19	F-6	TH1	I-5
Q20	F-7		
Q21	H-2		
Q22	G-5		
Q23	H-8		
Q24	G-6		
Q25	H-7		
Q26	D-3		
Q27	D-8		
Q28	E-3		
Q29	E-4		
Q30	E-5		
Q31	E-6		
Q32	E-6		
Q33	E-5		
Q34	F-8		
Q35	E-7		
Q36	C-8		
Q38	C-6		
Q39	B-3		
Q40	E-3		

YD-10 (Y DEMODULATOR)





NOTE	CHANGE INFORMATION	SERIAL NO.
①	R51 1300 ~150P C26 110P ~68P R58 (25C16E) → DELETED R32 (110K) → R37 (25C16E) R34 (100K) R34 (47P) R31 (10K) R31 (1100Ω) R30 (47P) → ADDED	10001 ~ (U/C) 10001 ~ (J) 10001 ~ (PM)
②	R304 47P ~16P R313 70K ~20K R301 180 P ~470Ω R313 100K R1, R2 G10 66C SHORT ~ OPEN	10101 ~ (U/C) 10051 ~ (J) 10001 ~ (PM) 10351 ~ (U/C) 10201 ~ (J) 10201 ~ (PM)
③	R71 260 ~280 R73 510 C37 160P SHORTED DL - 1 - 415 - 242 - 0 1 - 415 - 162 - 0G C400 47y/10V ADDED	10551 ~ (U/C) 10201 ~ (J) 10001 ~ (PM)
④	C201 QJ0027 ~ QJ001 C251 1P: ADJ PART FOR: OA COLOR FREQ. RESPONSE	10746 ~ (U/C) 10201 ~ (J) 10006 ~ (PM)
⑤	RV16 47K ~100K	10746 ~ (U/C) 10251 ~ (J) 10006 ~ (PM)
⑥	R301 10K ~2200 R302 47K ~39K R303 50K ~20K R304 47K ~50K	10686 ~ 15051 (U/C) 10351 ~ (1040J) 10006 ~ (PM) 10351 ~ (U/C) 10351 ~ (J) 10006 ~ (PM)

**YD-10**

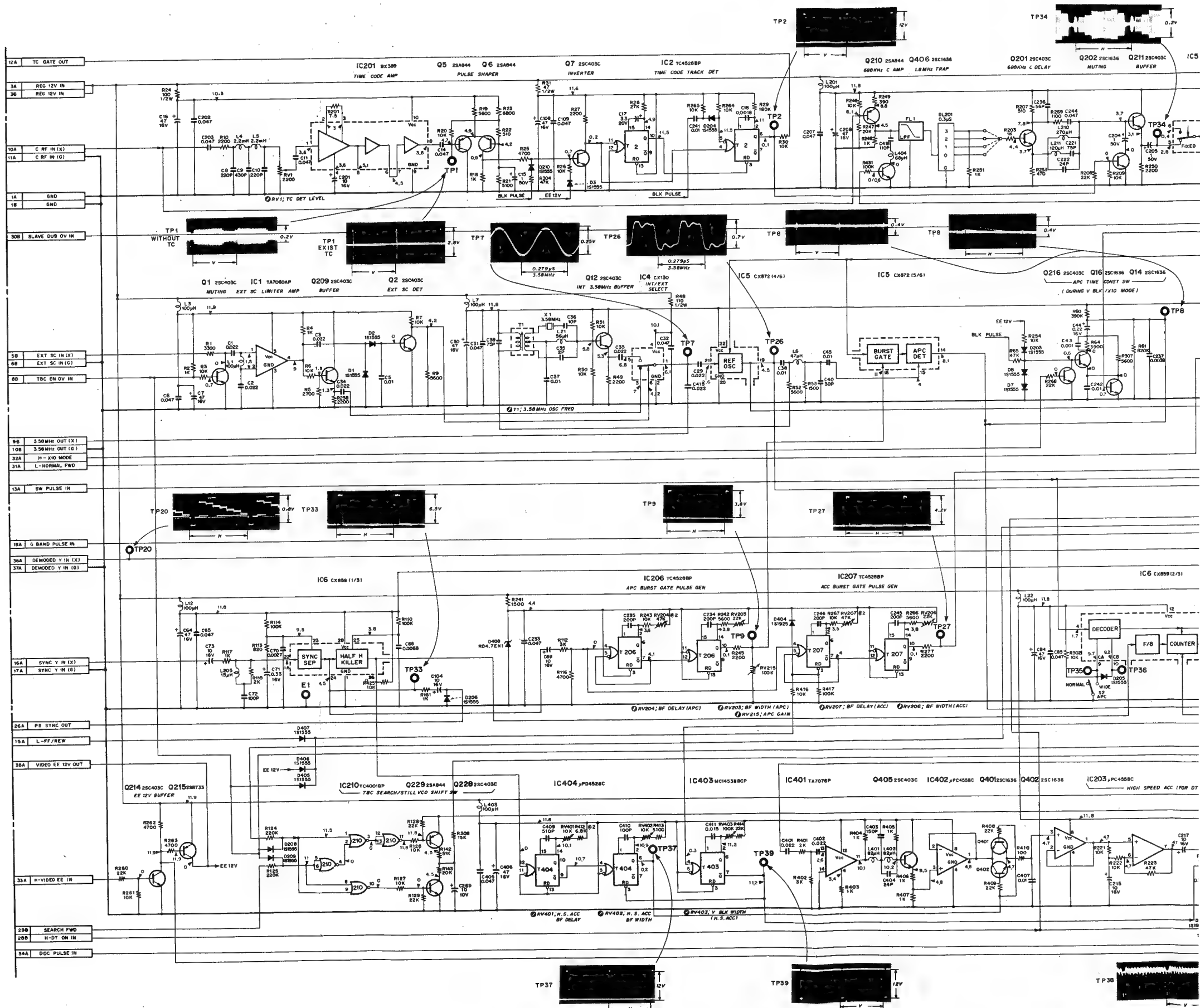
1-606-916-11~16  
BVU-820 (S/N.10001~(U/C)  
(S/N.10001~(J))  
BVU-820PM (S/N.10001~)

**CD-18, DL-1**

**CD-18, DL-1 (CHROMA DEMODULATOR)**

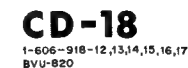
Serial No. 10021 and higher (J)  
Serial No. 10081 and higher (U/C)

NOTE		
MARK	CHANGE INFORMATION	SERIAL NO.
※ 1	R139 100 → 120 R421 62K → SHORTED R228 47K → 39K	10351 ~ (U/C) 10201 ~ (J)
※ 2	R412 10K → 6800 RV204 22K → 47K RV207 22K → 47K	11196 ~ (U/C) 10401 ~ (J)





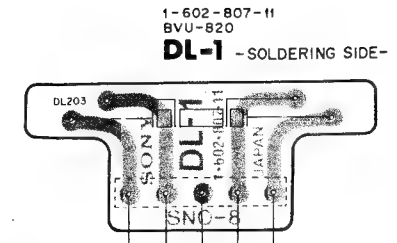
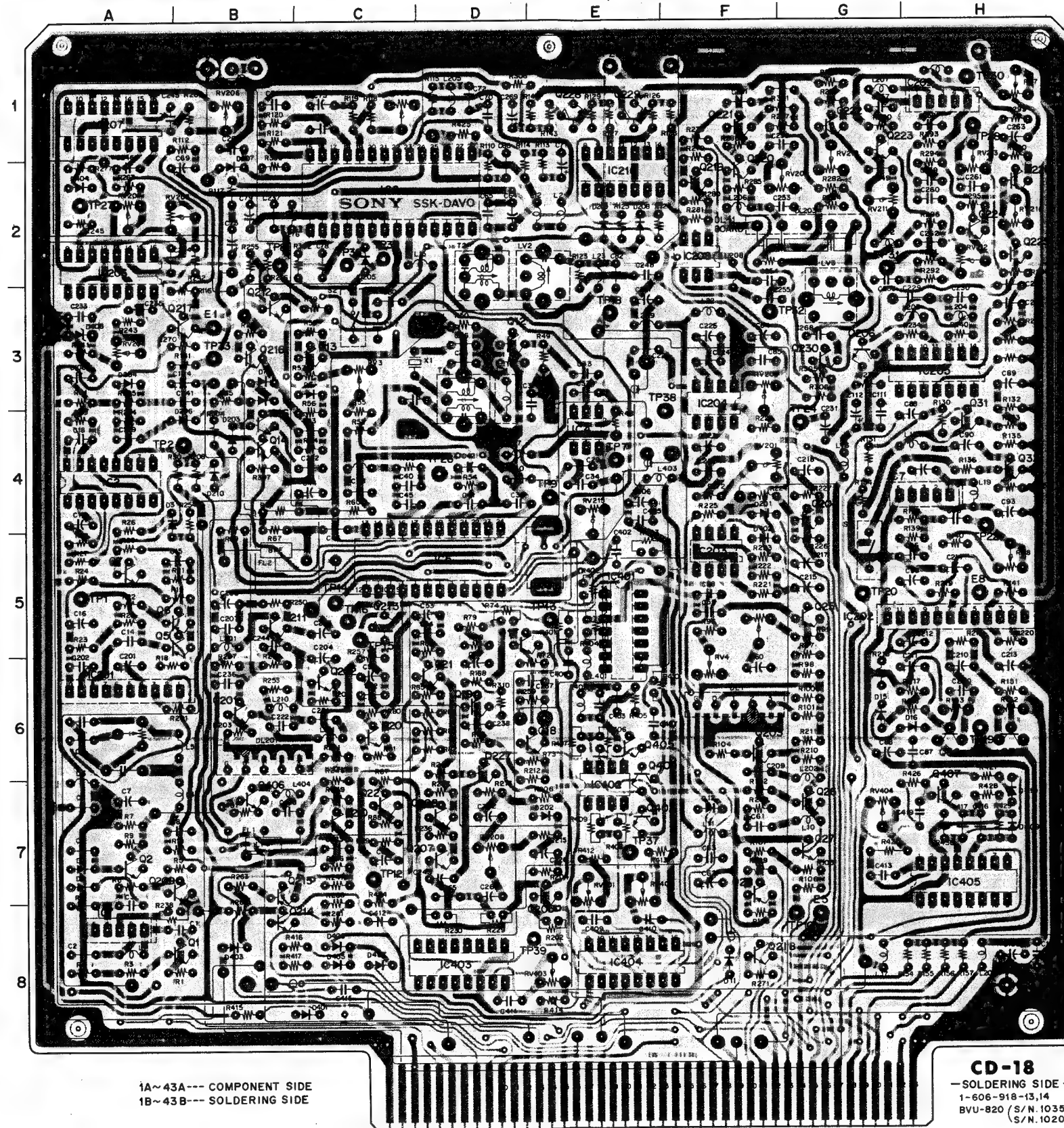
**CD-18, DL-1**





CD-18, DL-1 (CHROMA DEMODULATOR)

Serial No. 10201 to 10350 (J)  
Serial No. 10351 to 10895 (U/C)



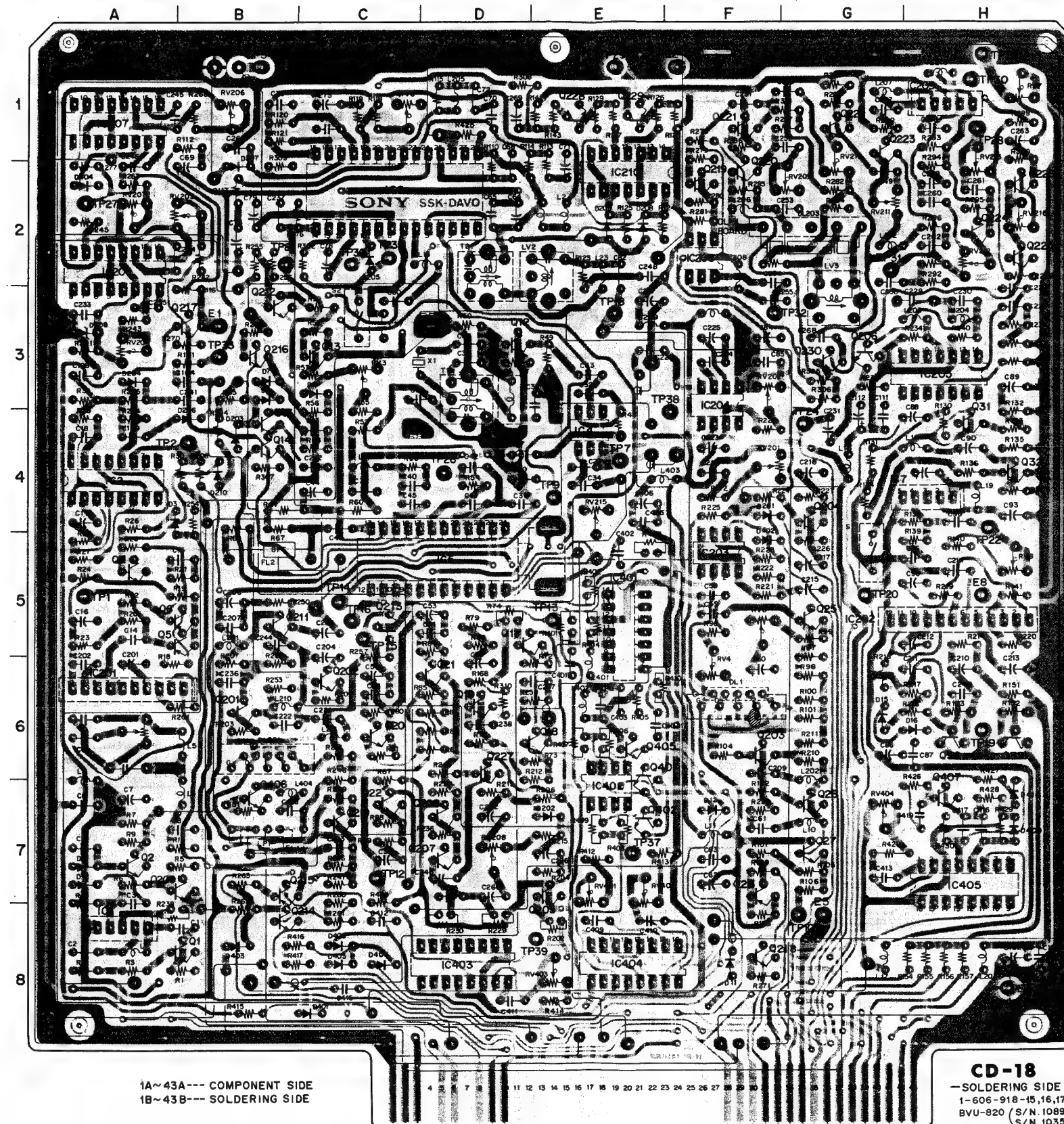
D1	A-7	Q1	B-8	RV201	F-4
D2	A-7	Q2	A-7	RV202	F-3
D3	B-4	Q5	B-5	RV203	B-2
D6	C-3	Q6	B-5	RV204	A-3
D7	B-3	Q7	A-5	RV206	B-1
D8	B-3	Q12	D-3	RV207	A-2
D11	F-8	Q13	C-3	RV208	D-7
D12	F-7	Q14	B-4	RV209	E-2
D15	G-6	Q16	B-4	RV210	G-1
D18	H-6	Q17	D-5	RV211	G-2
D201	F-4	Q18	E-6	RV212	H-2
D202	E-7	Q19	D-6	RV213	H-1
D203	B-4	Q20	C-6	RV215	E-4
D204	A-3	Q21	D-6	RV216	H-2
D206	C-2	Q22	C-7	RV401	E-7
D206	B-4	Q25	G-5	RV402	E-7
D207	B-1	Q26	G-7	RV403	E-8
D208	E-2	Q27	G-7	RV404	G-7
D209	E-2	Q28	F-7		
D210	B-4	Q31	H-4	SW1	G-5
D401	C-8	Q32	H-4	SW2	C-3
D402	F-5	Q36	H-6		
D403	B-8	Q37	H-6	T1	D-3
D404	A-2	Q201	B-6	T2	D-2
D405	C-8	Q202	C-6		
D406	C-8	Q203	F-6	TP1	A-5
D407	C-8	Q204	G-4	TP2	B-4
D408	A-3	Q205	E-7	TP7	E-4
D409	H-7	Q206	G-3	TP8	B-2
D410	H-7	Q207	D-7	TP9	E-4
		Q208	D-7	TP10	G-8
DL1	F-6	Q209	B-7	TP12	C-7
DL201	B-6	Q210	C-7	TP13	E-5
DL203	G-2	Q211	B-5	TP14	C-5
		Q212	B-3	TP15	C-5
E1	B-3	Q213	C-5	TP16	C-5
E2	F-1	Q214	B-8	TP18	E-3
E5	G-8	Q215	B-7	TP19	H-6
E7	H-8	Q216	B-3	TP20	G-6
E8	H-5	Q217	B-3	TP22	H-4
		Q218	F-8	TP24	G-4
FL1	B-7	Q219	F-2	TP25	H-1
FL2	B-5	Q220	F-2	TP26	D-4
		Q221	F-1	TP27	A-2
IC1	A-8	Q222	G-1	TP28	H-1
IC2	A-4	Q223	G-1	TP29	E-1
IC4	E-4	Q224	H-2	TP30	H-1
IC5	D-5	Q225	H-2	TP31	G-2
IC8	C-2	Q226	H-2	TP32	F-3
IC7	H-4	Q227	D-6	TP33	B-3
IC201	A-6	Q228	E-1	TP34	B-1
IC202	H-5	Q229	E-1	TP35	C-2
IC203	F-5	Q230	G-3	TP36	C-2
IC204	F-3	Q401	E-6	TP37	E-7
IC205	H-3	Q402	E-7	TP38	F-3
IC206	A-2	Q405	E-6	TP39	E-8
IC207	A-1	Q406	B-7		
IC208	F-2	Q407	H-7	X1	C-3
IC209	H-1				
IC210	E-2	RV1	A-6		
IC401	E-5	RV3	C-3		
IC402	E-7	RV4	F-6		
IC403	D-8	RV5	F-5		
IC404	E-8	RV6	C-1		
IC405	H-7	RV7	H-1		
		RV8	H-5		
LV2	E-2				
LV3	G-3				



CD-18, DL-1 CD-18, DL-1

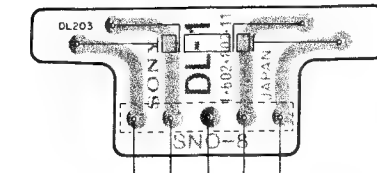
CD-18, DL-1 (CHROMA DEMODULATOR)

Serial No. 10351 and higher (J)  
Serial No. 10896 and higher (U/C)



1-602-807-11  
BVU-820

DL-1 - SOLDERING SIDE-

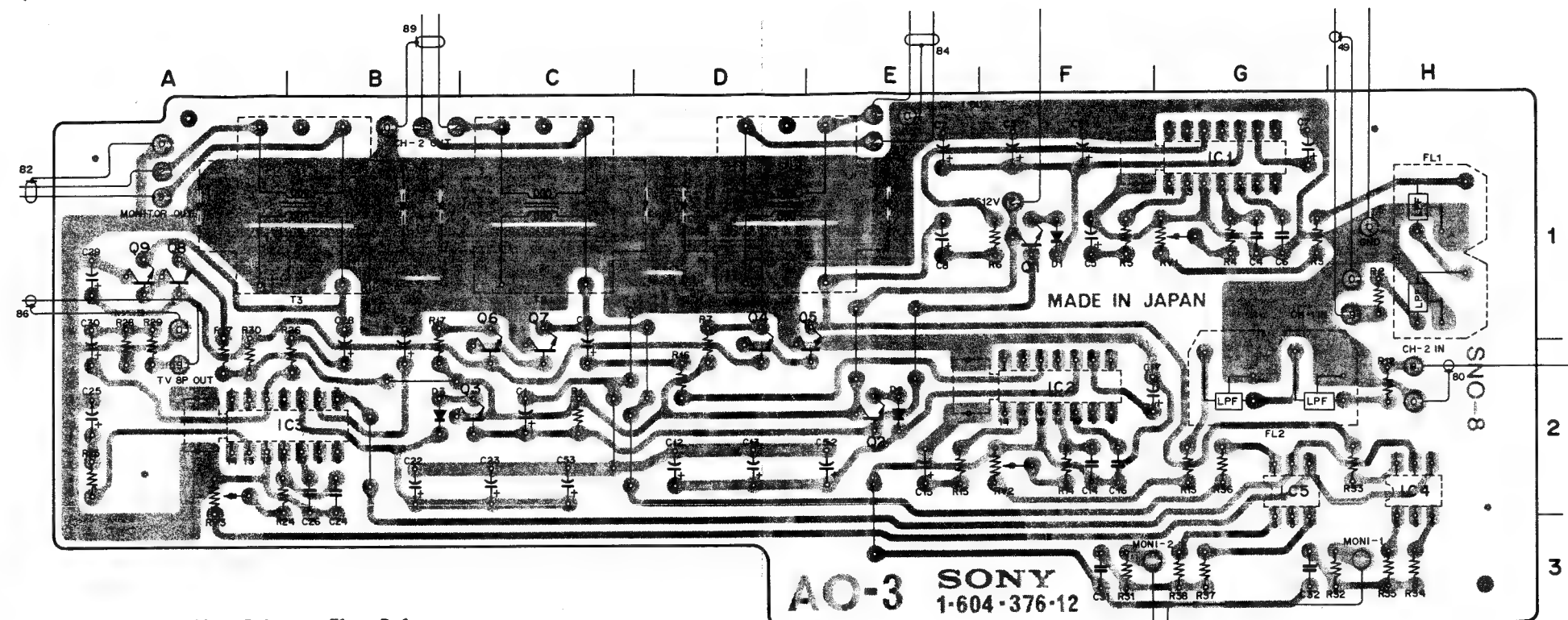


D1	A - 7	Q1	B - 8	RV201	F - 4
D2	A - 7	Q2	A - 7	RV202	F - 3
D3	B - 4	Q6	B - 5	RV203	B - 2
D6	C - 3	Q6	B - 5	RV204	A - 3
D7	B - 3	Q7	A - 5	RV206	B - 1
D8	B - 3	Q12	D - 3	RV207	A - 2
D11	F - 8	Q13	C - 3	RV208	D - 7
D12	F - 7	Q14	B - 4	RV209	G - 2
D15	G - 6	Q16	B - 4	RV210	G - 1
D16	H - 6	Q17	D - 5	RV211	G - 2
D201	F - 4	Q18	E - 8	RV212	H - 2
D202	E - 7	Q19	D - 6	RV213	H - 1
D203	B - 4	Q20	C - 6	RV215	E - 4
D204	A - 3	Q21	D - 6	RV216	H - 2
D205	C - 2	Q22	C - 7	RV401	E - 7
D206	B - 4	Q25	G - 5	RV402	E - 7
D207	B - 1	Q26	G - 7	RV403	E - 8
D208	E - 2	Q27	G - 7	RV404	G - 7
D209	E - 2	Q28	F - 7		
D210	B - 4	Q31	H - 4	SW1	G - 5
D401	C - 8	Q32	H - 4	SW2	C - 3
D402	F - 5	Q36	H - 6		
D403	B - 8	Q37	H - 6	T1	D - 3
D404	A - 2	Q201	B - 6	T2	D - 2
D405	C - 8	Q202	C - 6		
D406	C - 8	Q203	F - 8	TP1	A - 5
D407	C - 8	Q204	G - 4	TP2	B - 4
D408	A - 3	Q205	E - 7	TP7	E - 4
D409	H - 7	Q206	G - 3	TP8	B - 2
D410	H - 7	Q207	D - 7	TP9	E - 4
		Q208	D - 7	TP10	G - 8
DL1	F - 6	Q209	B - 7	TP12	C - 7
DL201	B - 6	Q210	C - 7	TP13	E - 5
DL203	G - 2	Q211	B - 5	TP14	C - 5
		Q212	B - 3	TP15	C - 5
E1	B - 3	Q213	C - 6	TP16	C - 5
E2	F - 1	Q214	B - 8	TP18	E - 3
E5	G - 8	Q215	B - 7	TP19	H - 6
E7	H - 8	Q216	B - 3	TP20	G - 5
E8	H - 5	Q217	B - 3	TP22	H - 4
		Q218	F - 8	TP24	G - 4
FL1	B - 7	Q219	F - 2	TP25	H - 1
FL2	B - 5	Q220	F - 2	TP26	D - 4
		Q221	F - 1	TP27	A - 2
IC1	A - 8	Q222	G - 1	TP28	H - 1
IC2	A - 4	Q223	G - 1	TP29	E - 1
IC4	E - 4	Q224	H - 2	TP30	H - 1
IC5	D - 5	Q225	H - 2	TP31	G - 2
IC8	C - 2	Q226	H - 2	TP32	F - 3
IC7	H - 4	Q227	D - 6	TP33	B - 3
IC201	A - 6	Q228	E - 1	TP34	B - 1
IC202	H - 5	Q229	E - 1	TP35	C - 2
IC203	F - 5	Q230	G - 3	TP36	C - 2
IC204	F - 3	Q401	E - 6	TP37	E - 7
IC205	H - 3	Q402	E - 7	TP38	F - 3
IC206	A - 2	Q405	E - 6	TP39	E - 8
IC207	A - 1	Q406	B - 7		
IC208	F - 2	Q407	H - 7	X1	C - 3
IC209	H - 1				
IC210	E - 2				
IC401	E - 5	RV1	A - 6		
IC402	E - 7	RV3	C - 3		
IC403	D - 8	RV4	F - 6		
IC404	E - 8	RV5	F - 5		
IC405	H - 7	RV6	C - 1		
		RV7	H - 1		
		RV8	H - 5		
LV2	E - 2				
LV3	G - 3				



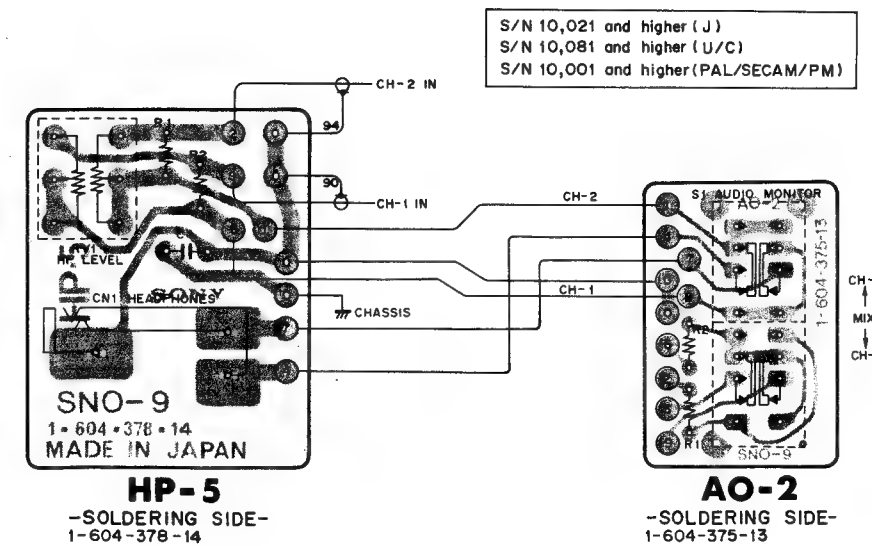
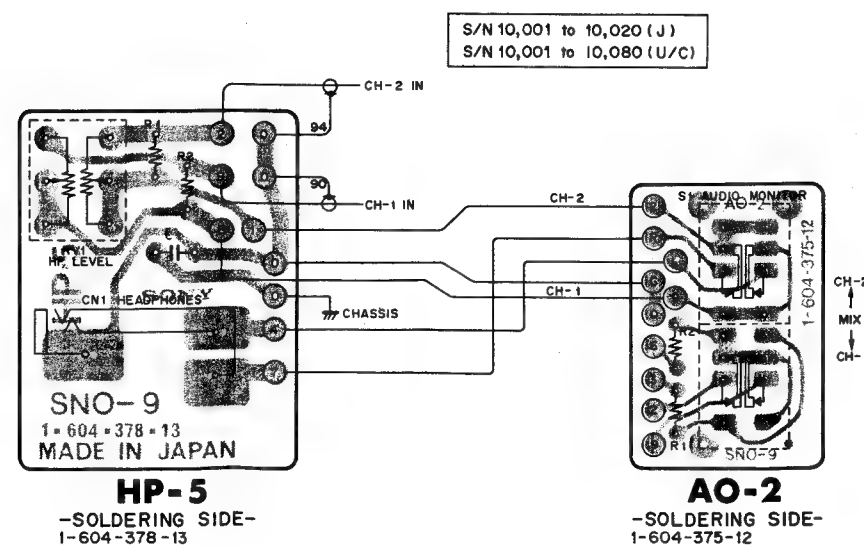
AO-3, AO-2, HP-5      AO-3, AO-2, HP-5

AO-3 (AUDIO OUTPUT AMPLIFIER)  
AO-2 (AUDIO OUTPUT SELECTOR)  
HP-5 (HEADPHONES)

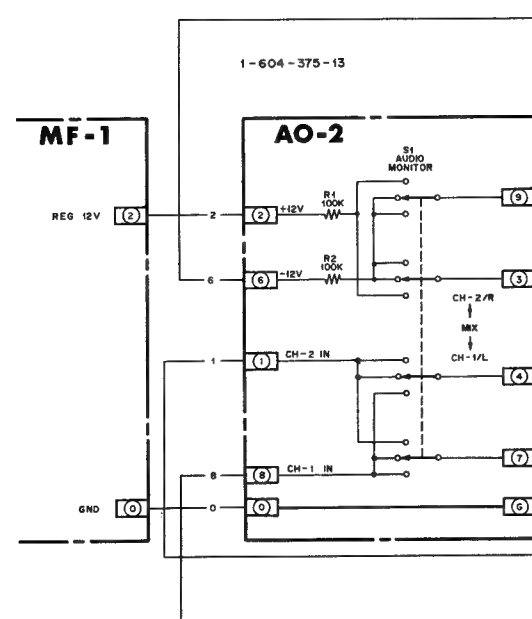
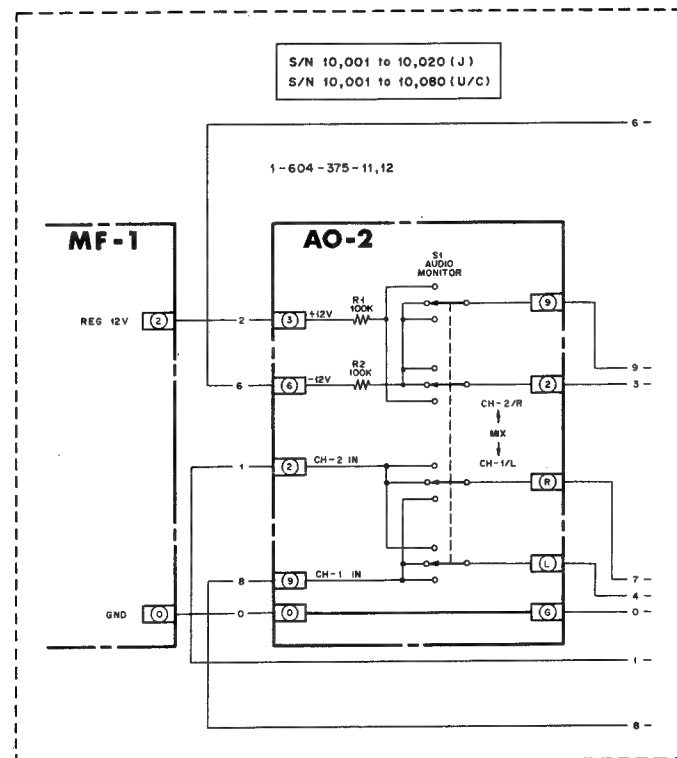


D1	F-1	Q1	F-1	T1	D-1
D2	E-2	Q2	E-2	T2	C-1
D3	B-2	Q3	C-2	T3	B-1
		Q4	D-2		
FL1	H-1	Q5	E-2		
FL2	G-2	Q6	C-2		
		Q7	C-2		
IC1	G-1	Q8	A-1		
IC2	F-2	Q9	A-1		
IC3	A-2				
IC4	H-2	RV1	G-1		
IC5	G-2	RV2	F-2		
		RV3	A-2		

**AO-3 -SOLDERING SIDE-**  
1-604-376-12  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

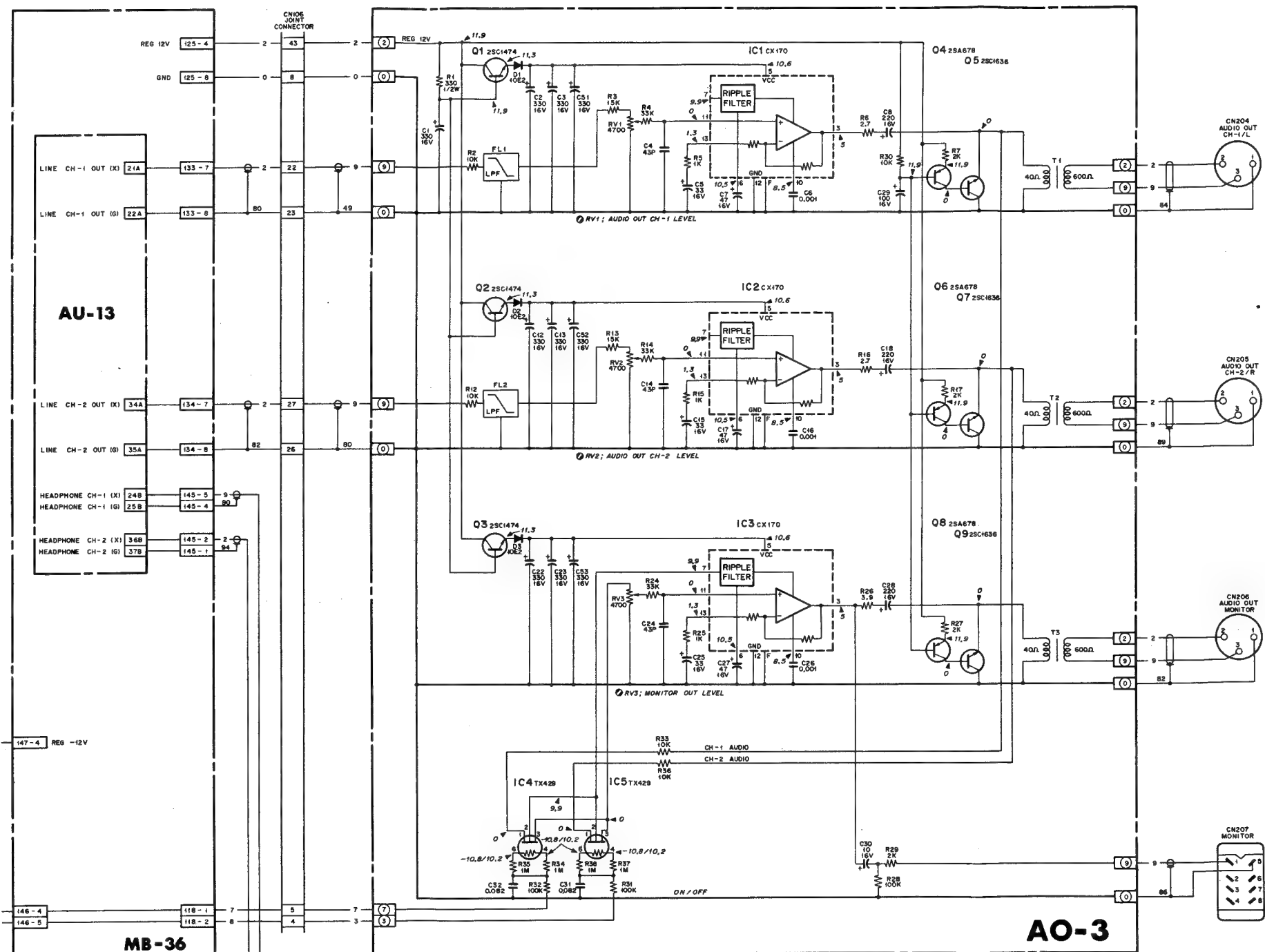


AO-3 (AUDIO OUTPUT AMPLIFIER)  
AO-2 (AUDIO OUTPUT SELECTOR)  
HP-5 (HEADPHONES)



S/N 10,021 and higher (J)  
S/N 10,081 and higher (U/C)  
S/N 10,001 and higher (PAL/SECAM/PM)

17-31



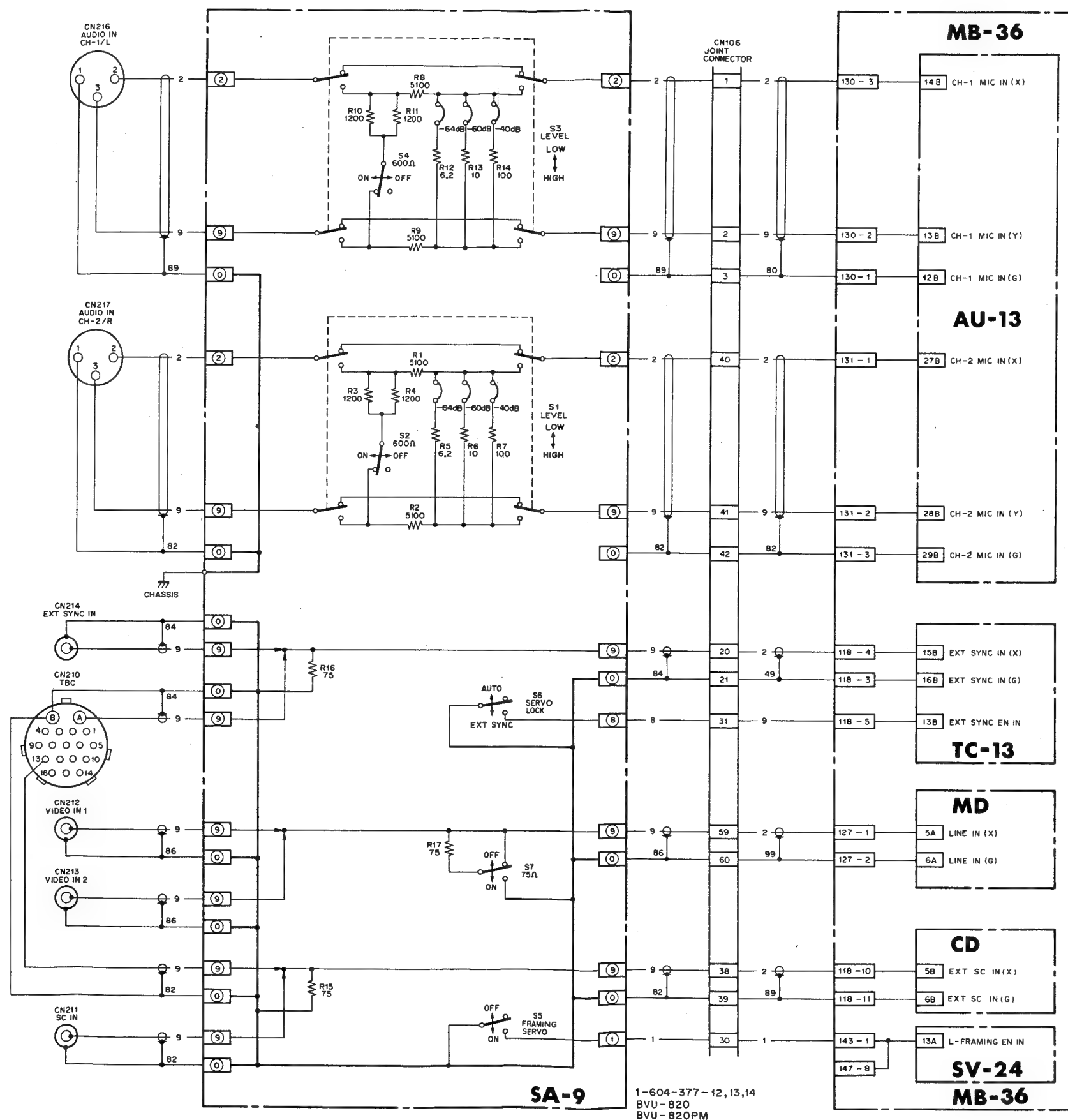
AO-3

1-604-376-11,12  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

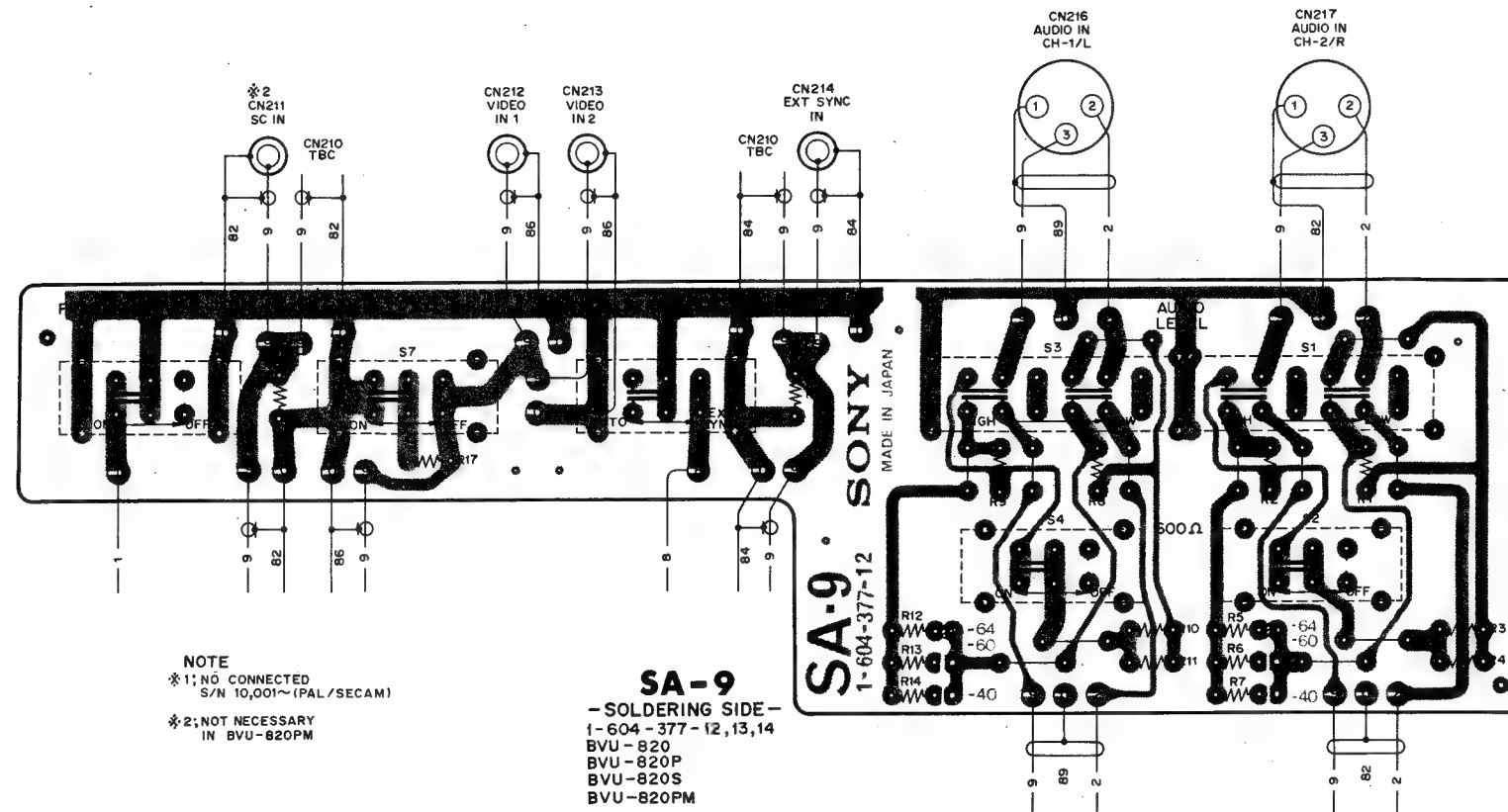
17-32

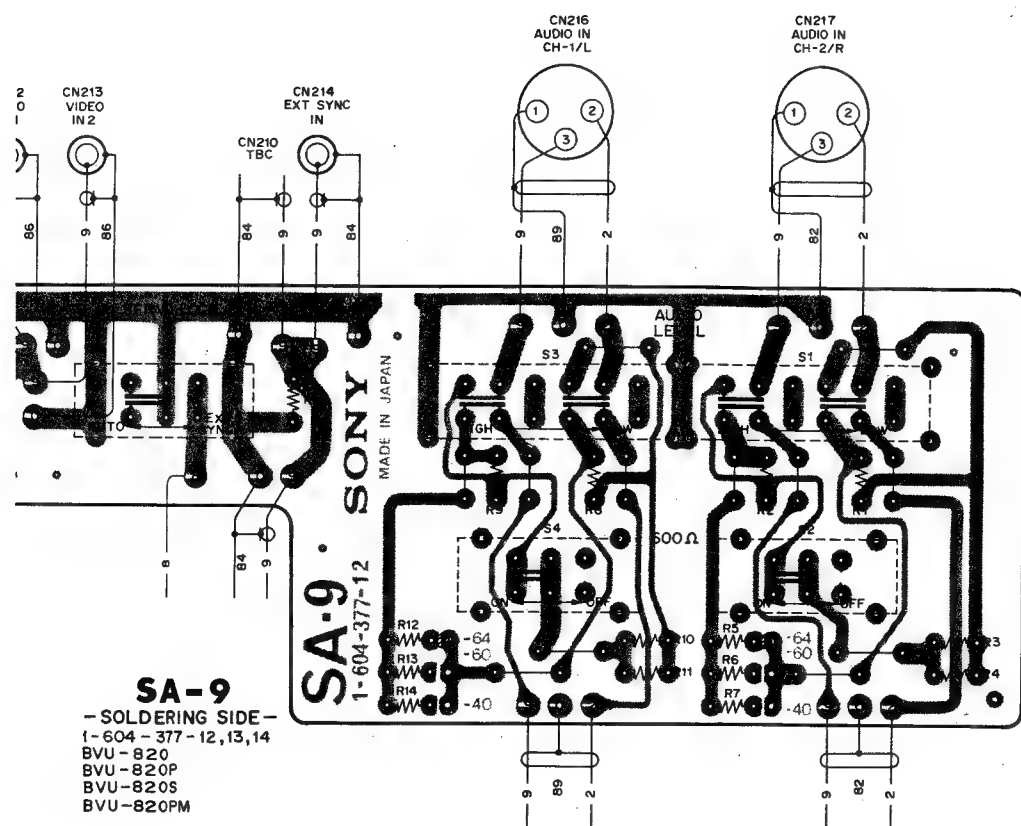
# SA-9 SA-9

## SA-9 (SYSTEM SELECT SWITCH) (AUDIO INPUT LEVEL SELECT)



SA-9 (SYSTEM SELECT SWITCH)  
(AUDIO INPUT LEVEL SELECT)

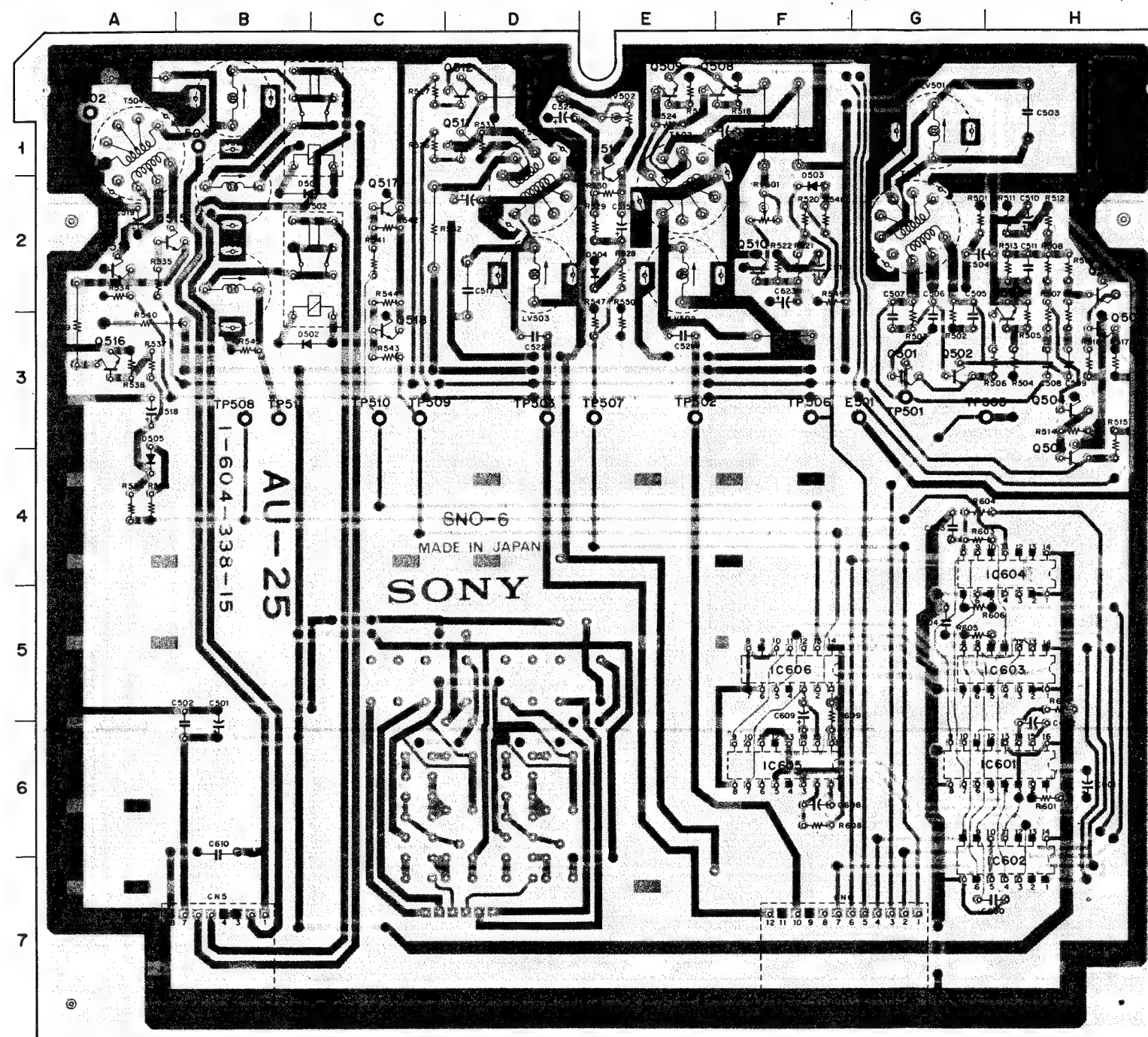




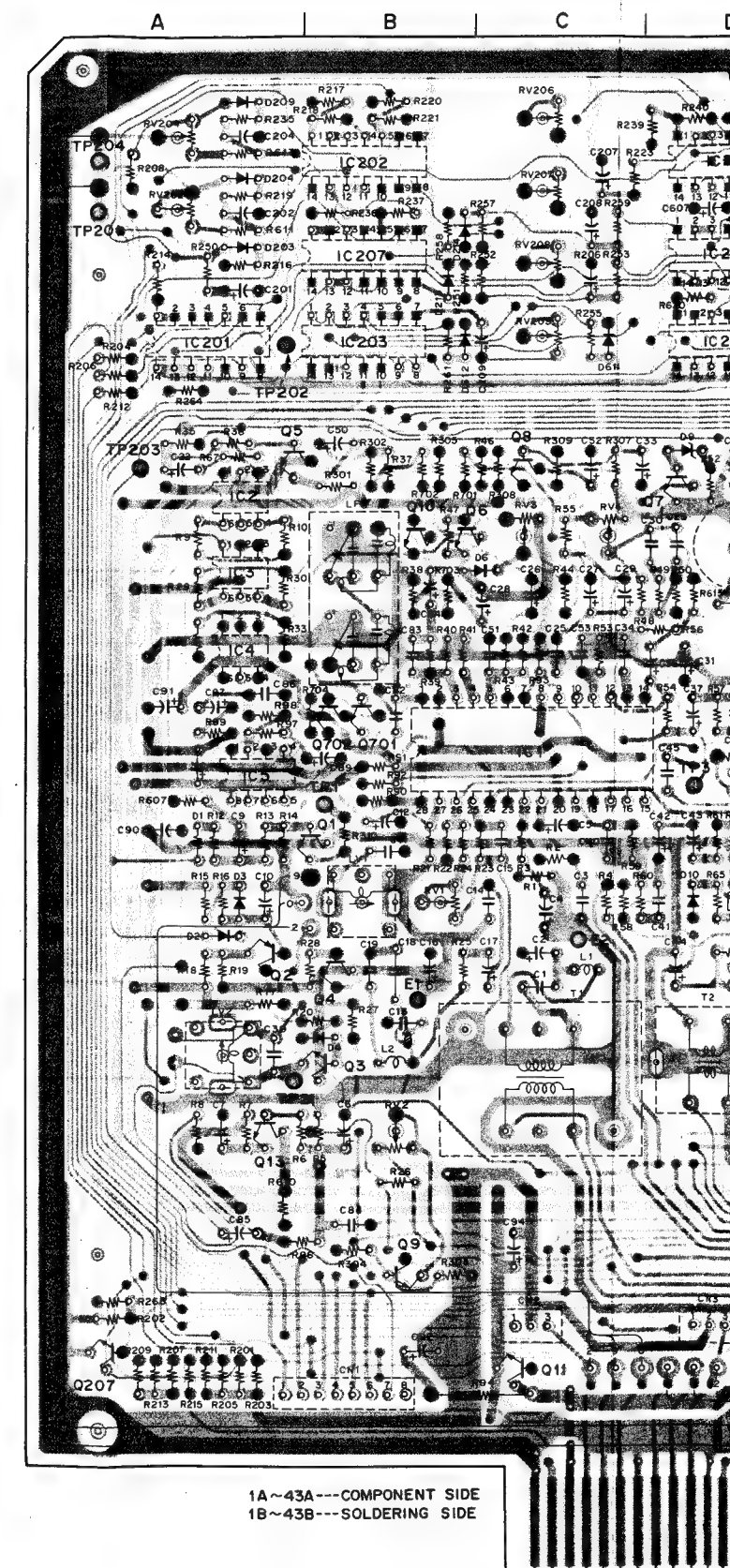


AU-13 (AUDIO REC/PB AMPLIFIER)  
(AUDIO SYSTEM CONTROL)  
AU-25 (BIAS/ERASE OSCILLATOR)

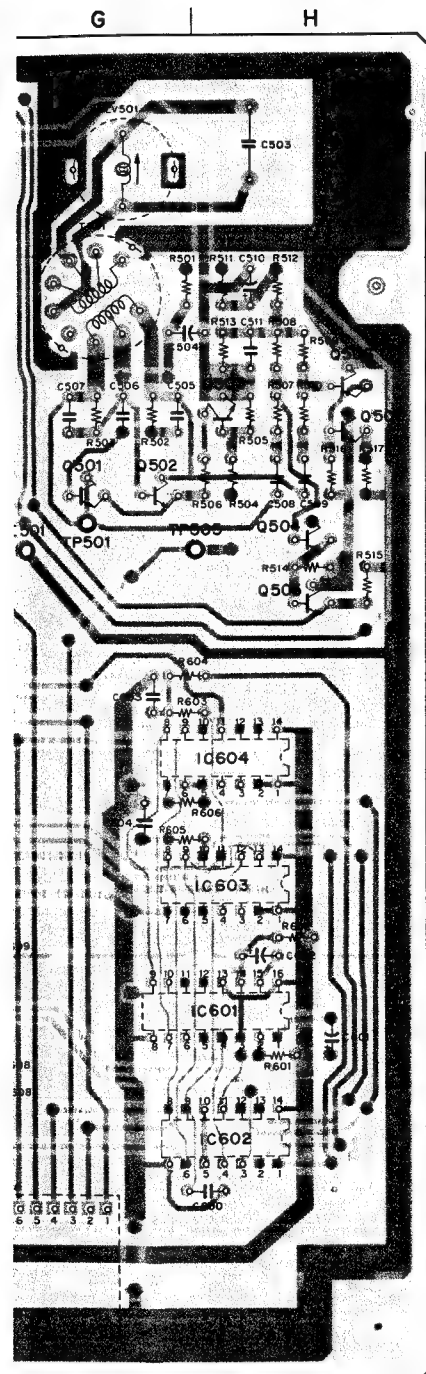
Serial No. 10201 and higher (J)  
Serial No. 10646 and higher (U/C)



**AU-25** -SOLDERING SIDE-  
1-604-338-15  
BVU-820 (S/N.10646~(U/C))  
BVU-820P S/N.10201~(J)  
BVU-820S S/N.10051~  
BVU-820PM S/N.10006~

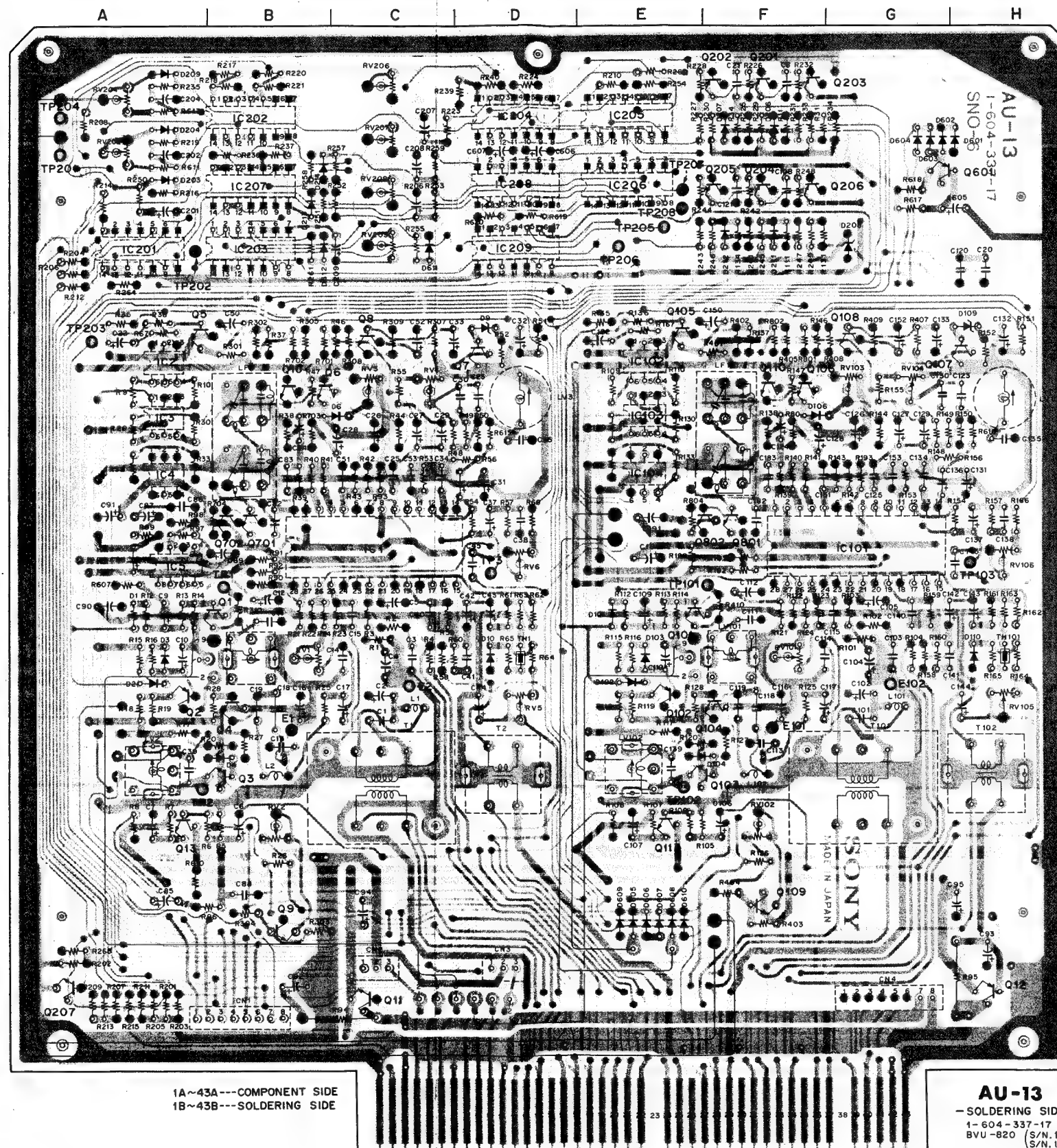


1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE



**AU-25 -SOLDERING SIDE-**  
1-604-338-15  
BVU-820 (S/N.10646~(U/C))  
BVU-820P (S/N.10201~(J))  
BVU-820S (S/N.10051~)  
BVU-820PM (S/N.10006~)

- CN5 B-7
- CN6 F-7
- D501 B-2
- D502 B-3
- D503 F-2
- D504 E-2
- D506 A-4
- E501 G-3
- E502 A-1
- IC801 H-6
- IC802 H-7
- IC803 H-5
- IC804 H-4
- IC805 F-6
- IC806 F-6
- LV501 G-1
- LV502 E-2
- LV503 D-2
- LV504 B-1
- LV505 B-2
- LV506 B-2
- Q501 G-3
- Q502 G-3
- Q503 H-3
- Q504 H-3
- Q505 H-4
- Q506 H-2
- Q507 H-3
- Q508 F-1
- Q509 E-1
- Q510 F-2
- Q511 D-1
- Q512 D-1
- Q513 E-1
- Q514 A-2
- Q515 A-2
- Q516 A-3
- Q517 C-2
- Q518 C-3
- RV501 F-2
- RV502 E-1
- RY501C-1
- RY502C-2
- T501 G-2
- T502 E-2
- T503 D-2
- T504 A-1
- TP501 G-3
- TP502 E-3
- TP503 D-3
- TP504 B-1
- TP505 H-3
- TP506 F-3
- TP507 E-3
- TP508 B-3
- TP509 C-3
- TP510 C-3
- TP511 B-3



1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

- CN3 D-8
- CN4 G-8
- D1 A-5
- D2 A-6
- D3 A-6
- D4 B-6
- D6 C-4
- D9 D-3
- D10 D-6
- D101 E-5
- D102 E-6
- D103 E-6
- D104 F-6
- D106 F-4
- D109 H-3
- D110 H-6
- D203 A-2
- D204 A-1
- D206 F-1
- D207 F-1
- D208 G-2
- D209 A-1
- D211 F-2
- D212 F-2
- D213 B-2
- D214 B-2
- D801 H-1
- D802 G-1
- D803 G-1
- D804 G-1
- D805 E-8
- D806 E-8
- D807 E-8
- D808 E-8
- D809 E-8
- D610 E-8
- D611 C-2
- D612 B-2
- E1 B-6
- E2 C-6
- E101 F-6
- E102 G-6
- IC1 C-5
- IC2 A-3
- IC3 A-4
- IC4 A-4
- IC5 A-5
- IC101 G-5
- IC102 E-3
- IC103 E-4
- IC104 E-4
- IC201 A-2
- IC202 B-1
- IC203 B-2
- IC204 D-1
- IC205 E-1
- IC206 E-2
- IC207 B-2
- IC208 D-2
- IC209 D-2
- LF1 B-4
- LF101 F-4
- LV1 B-6
- LV2 A-6
- LV3 D-3
- LV101 F-6
- LV102 E-6
- LV103 H-3
- Q1 B-5
- Q2 A-6
- Q3 B-7
- Q4 B-6
- Q5 A-3
- Q6 C-3
- Q7 D-3
- Q8 C-3
- Q9 B-8
- Q10 B-3
- Q11 C-8
- Q12 H-8
- Q13 A-7
- Q101 E-5
- Q102 E-6
- Q103 F-7
- Q104 F-6
- Q105 E-3
- Q106 F-3
- Q107 H-3
- Q108 G-3
- Q109 F-8
- Q201 F-1
- Q202 F-1
- Q203 F-1
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- Q972



AU-13 (AUDIO REC/PB AMPLIFIER)  
(AUDIO SYSTEM CONTROL)  
AU-25 (BIAS/ERASE OSCILLATOR)

Serial No. 10151 and higher (J)  
Serial No. 10201 and higher (U/C)

NOTE

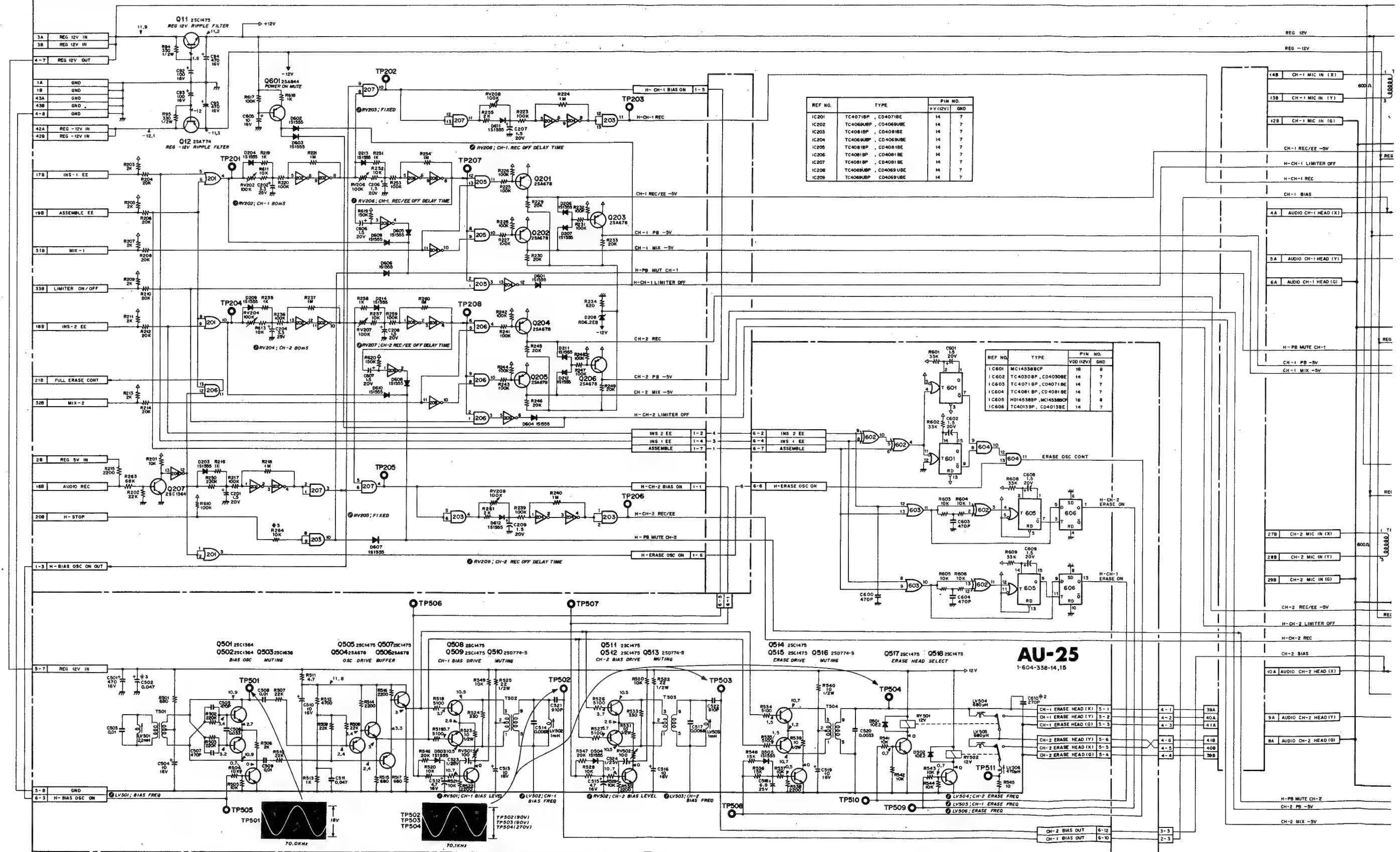
MARK	CHANGE INFORMATION	SERIAL NO.
1	C23, C23 0.001 ADDED	U/C: 10351 ~
2	C35, C135 0.002 → 0.018	J: 10201 ~
3	LV3, LV103 3.3mm → 4.7mm	S: 10021 ~
4	R24, R124 10K → 470K	S: 10021 ~
5	RV1, RV101 10K → 47K	PM: 10001 ~

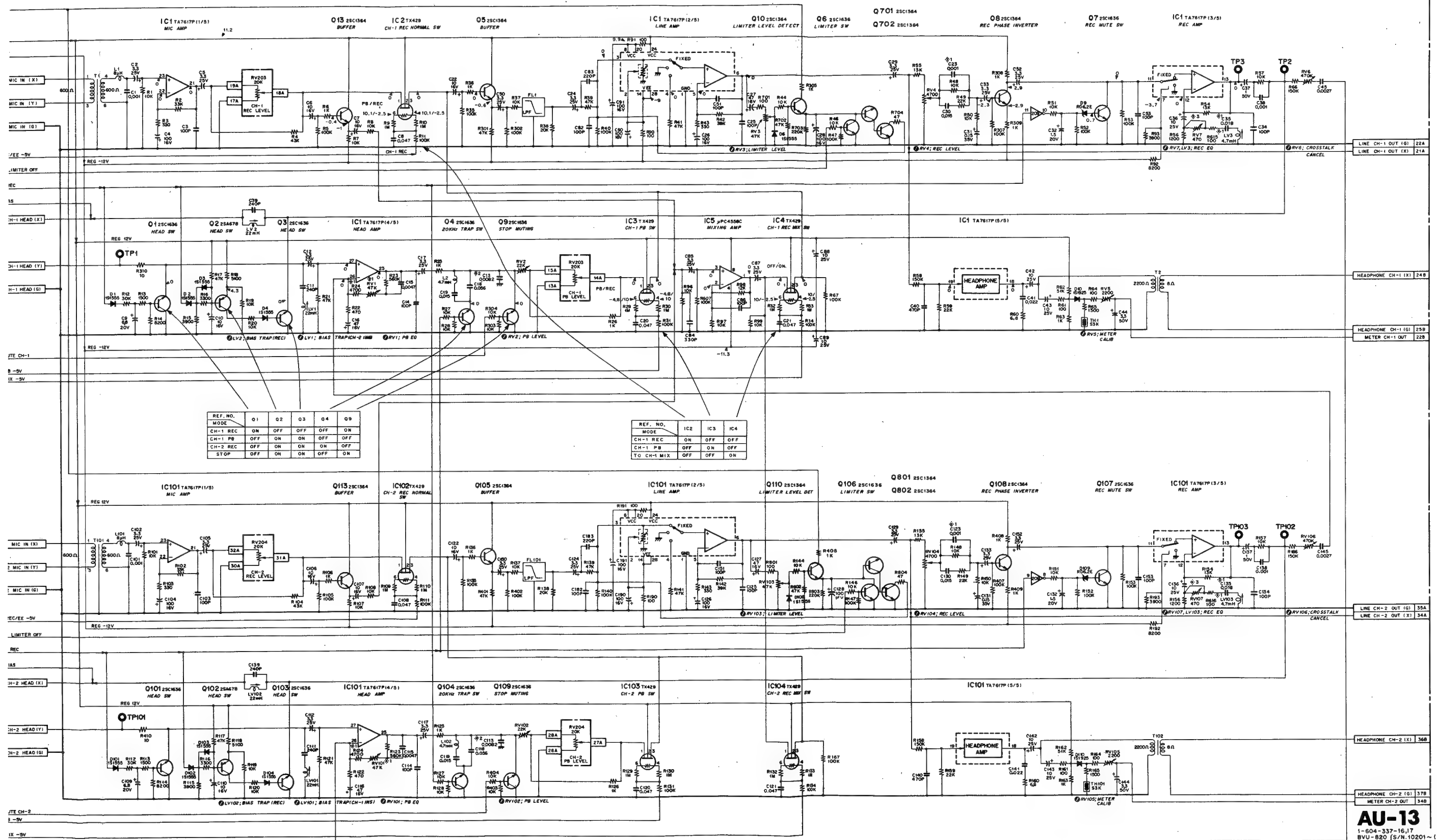
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	C13, C13 0.002 ADDED	U/C: 10351 ~
2	ADD OR DELETE SELECTABLE	J: 10201 ~
3	P: 10021 ~	S: 10021 ~
4	C610 270P ADDED	PM: 10001 ~

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	C502 10/16V → 0.047	U/C: 10448 ~
2	RV17 1 SHORTED	J: 10201 ~
3	R264 10K ADDED	S: 10001 ~
4	PM: 10006 ~	PM: 10006 ~





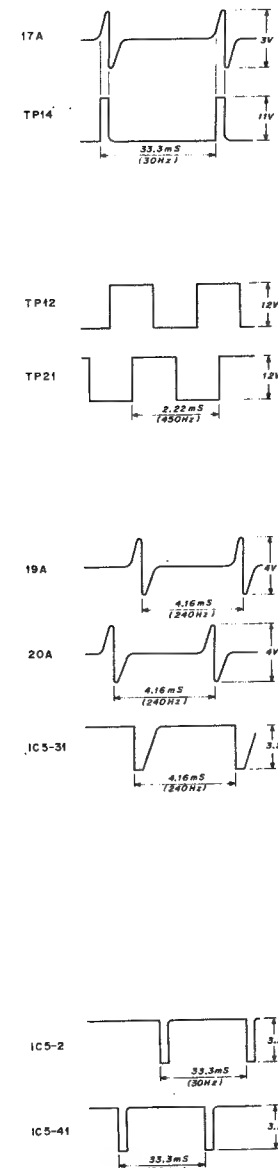
**AU-13**

1-604-337-16.17  
BVU-820 (S/N.10201~(U/C))  
BVU-820P(S/N.10221~)  
BVU-820S(S/N.10001~)  
BVU-820PM(S/N.10001~)

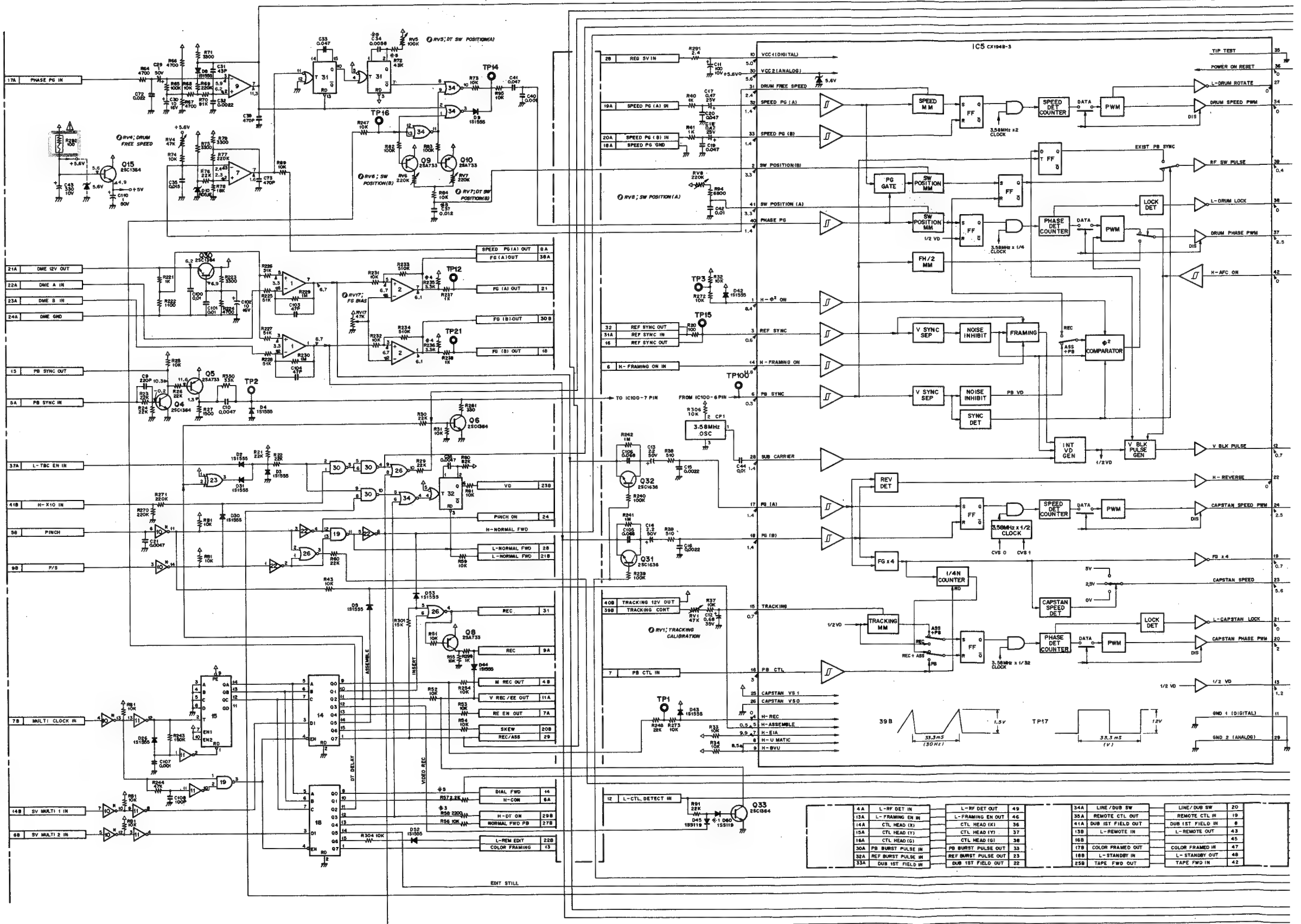
SV-24 (DRUM SERVO)  
(CAPSTAN SERVO)

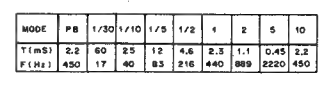
Serial No. 10646 and higher (U/C)  
Serial No. 10201 and higher (J)

SV-24 SV-24



MARK	CHANGE INFORMATION	SERIAL NO.
*1	D60 ADDED	10,746~(U/C) 10,201~(J)
*2	C45 0.1 → 0.47 R107 100K → 560K R351 100K ADD RV9 220K → 100K	10,746~(U/C) 10,251~(J)
*3	R58 10K → 220K	10896~(U/C) 10,351~(J) 10006~(PM)
*4	R235 1K → 3.3K R236 1K → 3.3K	10996~(U/C) 10,351~(J) 10006~(PM)
*5	R57 10K → 220K R72 51K → 45K C34 0.0047 → 0.0086 C37 0.01 → 0.012	11886~(U/C) 10651~(J) 10041~(PM)



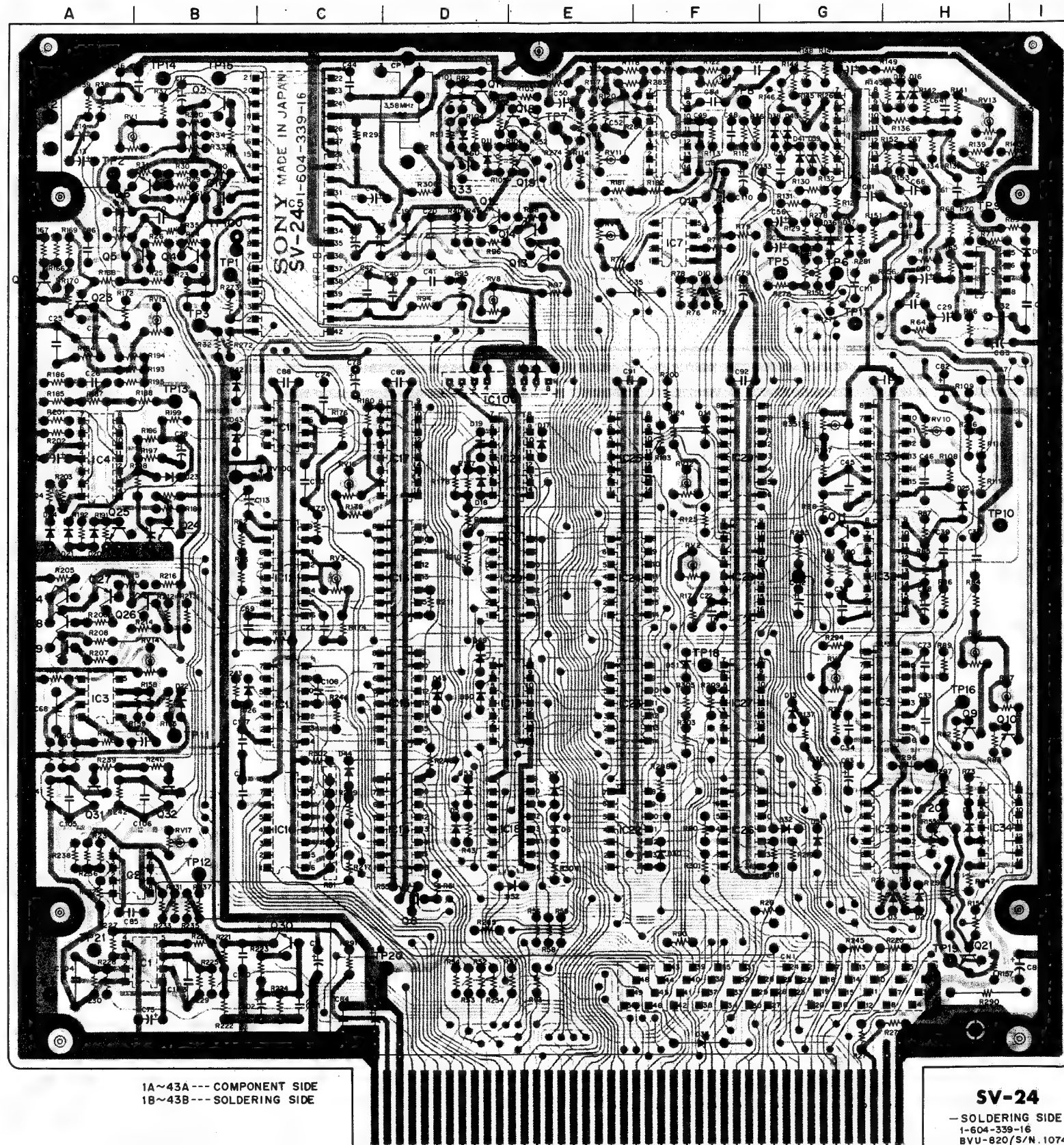


1-604-339-15,16  
BVU-820 (S/N.10646 ~ (U/C))  
(S/N.10201 ~ (J))  
BVU-820PM (S/N.10006 ~)

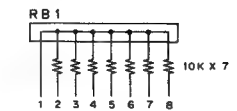


SV-24 (DRUM SERVO)  
(CAPSTAN SERVO)Serial No. 10746 and higher (U/C)  
Serial No. 10201 and higher (J)

REF. NO.	TYPE	PIN NO.			
		+V(+2V)	+V(5V)	GND	-V(-2V)
IC 1	μPC4558C	8	4		
IC 2	NJM2903D	8	4		
IC 3	μPC4558C	8			4
IC 4	μPC324C	4			11
IC 5	CX194A	30	10	11, 29	
IC 6	μPC324C	4			11
IC 7	μPC311C	8		1, 4	
IC 8	μPC324C	4			11
IC 9	μPC311C	8		1, 4	
IC 10	M54517P			8	
IC 11	TC4069UBP, CD4069UBE	14		7	
IC 12	MC145388CP	16		8	
IC 13	μPC4558C	8			4
IC 14	TC4099BP, CD4099BE	16		8	
IC 15	TC40161BP, CD40161BE	16		8	
IC 16	TC4053BP, CD4053BE	16		8	
IC 17	TC4052BP, CD4052BE	16		8	
IC 18	TC4099BP, CD4099BE	16		8	
IC 19	TC4011BP, CD4011BE	14		7	
IC 20	TC4023BP, CD4023BE	14		7	
IC 21	TC4001BP, CD4001BE	14		7	
IC 22	TC4069UBP, CD4069UBE	14		7	
IC 23	TC4030BP, CD4030BE	14		7	
IC 24	TC4011BP, CD4011BE	14		7	
IC 25	TC4013BP, CD4013BE	14		7	
IC 26	TC4001BP, CD4001BE	14		7	
IC 27	TC4069UBP, CD4069UBE	14		7	
IC 28	MC145388CP	16		8	
IC 29	TC4053BP, CD4053BE	16		8	
IC 30	TC4011BP, CD4011BE	14		7	
IC 31	MC145388CP	16		8	
IC 32	MC145388CP	16		8	
IC 33	MC145388CP	16		8	
IC 34	TC4001BP, CD4001BE	14		7	



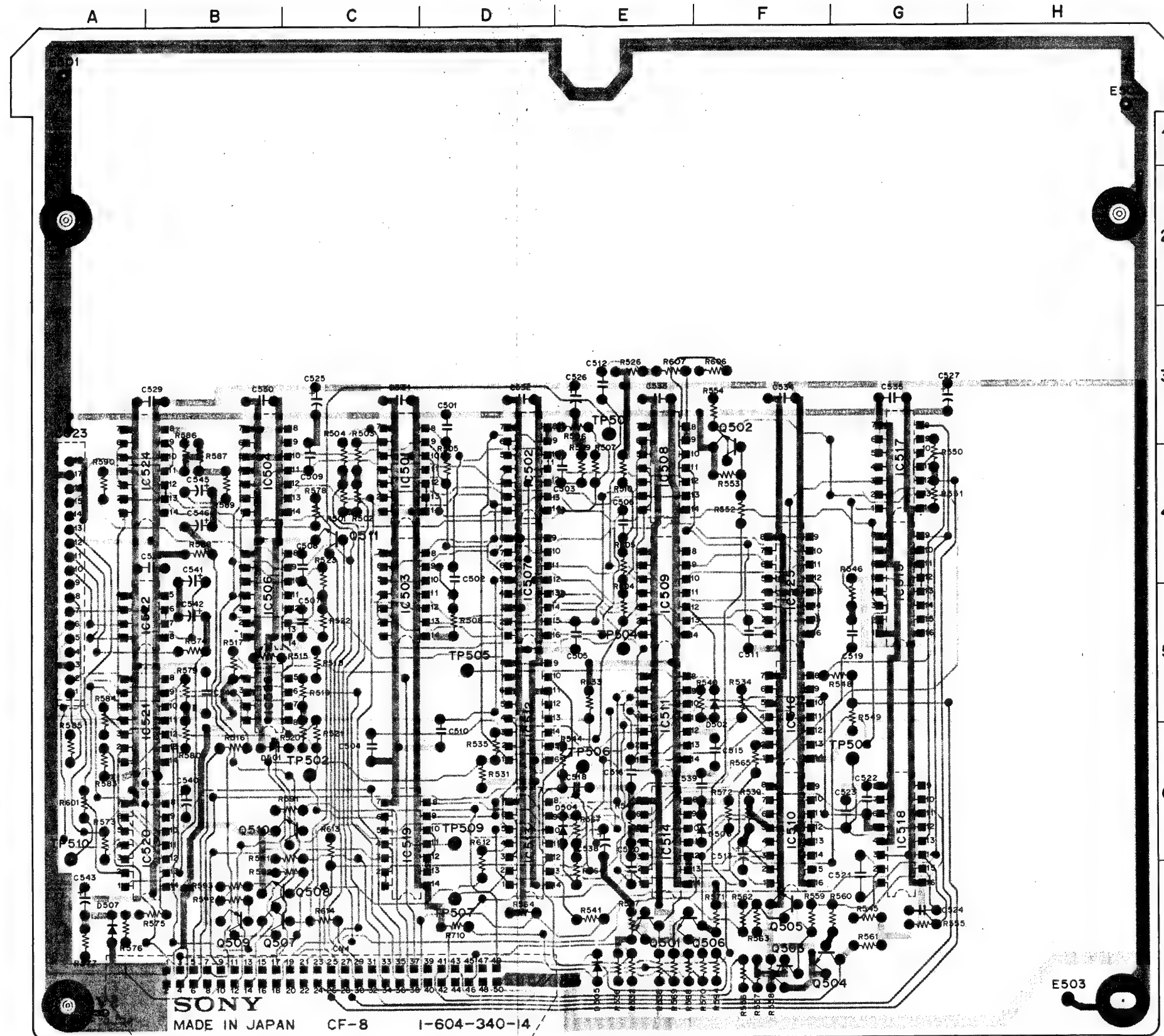
CN1 G-8	IC1 B-8	RB1 C-7
CP1 D-1	IC2 A-7	RV1 A-1
D2 H-7	IC3 A-6	RV2 F-5
D3 H-7	IC4 A-4	RV3 C-5
D4 A-2	IC5 C-2	RV4 E-2
D5 D-7	IC6 F-1	RV5 G-6
D6 E-7	IC7 F-2	RV6 H-5
D7 E-7	IC8 G-1	RV7 H-6
D8 I-2	IC9 H-2	RV8 D-3
D9 H-7	IC10 C-7	RV9 G-4
D10 F-3	IC11 C-6	RV10 H-4
D11 D-2	IC12 C-5	RV11 E-2
D13 G-6	IC13 C-4	RV12 F-4
D14 F-4	IC14 D-7	RV13 H-1
D15 H-1	IC15 D-6	RV14 B-5
D16 H-1	IC16 D-5	RV15 B-3
D17 E-4	IC17 D-4	RV16 C-4
D18 D-4	IC18 E-7	RV17 B-7
D19 D-4	IC19 E-6	RV100 C-4
D20 A-4	IC20 E-5	
D21 A-4	IC21 E-4	TP1 B-2
D22 B-6	IC22 E-7	TP2 A-2
D23 B-4	IC23 E-6	TP3 B-3
D24 A-4	IC24 E-5	TP5 G-2
D25 H-4	IC25 E-4	TP6 G-2
D26 B-6	IC26 F-7	TP7 E-1
D30 F-7	IC27 F-6	TP8 F-1
D31 G-7	IC28 F-5	TP9 H-2
D32 G-7	IC29 F-4	TP10 H-4
D33 F-8	IC30 H-7	TP11 B-6
D36 G-2	IC31 H-6	TP12 B-7
D37 G-2	IC32 H-5	TP13 B-3
D38 G-1	IC33 H-4	TP14 B-1
D39 G-2	IC34 H-7	TP15 B-1
D40 G-1	IC100 D-3	TP16 H-6
D41 G-2		TP17 G-3
D42 B-3	Q3 E-1	TP18 F-6
D43 B-4	Q4 B-2	TP19 H-8
D44 C-6	Q5 B-2	TP20 C-8
D45 D-6	Q6 B-2	TP100 B-2
D49 D-5	Q7 D-7	
D50 D-6	Q8 D-7	
D51 F-6	Q9 H-6	
D52 D-7	Q10 H-6	
D53 D-7	Q11 B-4	
D60 D-2	Q12 D-2	
	Q13 E-2	
	Q14 E-2	
	Q15 F-2	
	Q16 B-2	
	Q17 D-1	
E1 A-8	Q18 E-1	
E2 A-1	Q19 E-2	
E3 I-1	Q20 H-7	
E4 H-8	Q21 H-8	
	Q22 A-3	
	Q23 A-3	
	Q24 B-4	
	Q25 A-4	
	Q26 B-5	
	Q27 A-5	
	Q28 A-5	
	Q29 A-5	
	Q30 C-8	
	Q31 A-7	
	Q32 B-7	
	Q33 D-2	
	Q34 A-5	



## SV-24

—SOLDERING SIDE—  
1-604-339-16  
BVU-820 (S/N. 10746 ~ (U/C))  
(S/N. 10201 ~ (J))  
BVU-820PM (S/N. 10006 ~ )

CF-8 (CTL REC PB AMPLIFIER)



CN1 B-7

D501 B-6  
D502 F-5  
D504 E-6  
D505 E-7  
D506 F-6  
D507 A-7

E501 A-1  
E502 H-1  
E503 H-7

IC501 C-4  
IC502 D-4  
IC503 C-5  
IC504 B-4  
IC506 B-5  
IC507 D-4  
IC508 E-4  
IC509 E-5  
IC510 F-6  
IC511 C-4  
IC512 D-5  
IC513 D-6  
IC514 E-6  
IC515 G-5  
IC516 F-5  
IC517 G-4  
IC518 G-6  
IC519 C-6  
IC520 A-6  
IC521 A-5  
IC522 A-5  
IC523 A-4  
IC524 A-4  
IC525 F-5  
IC526 B-5

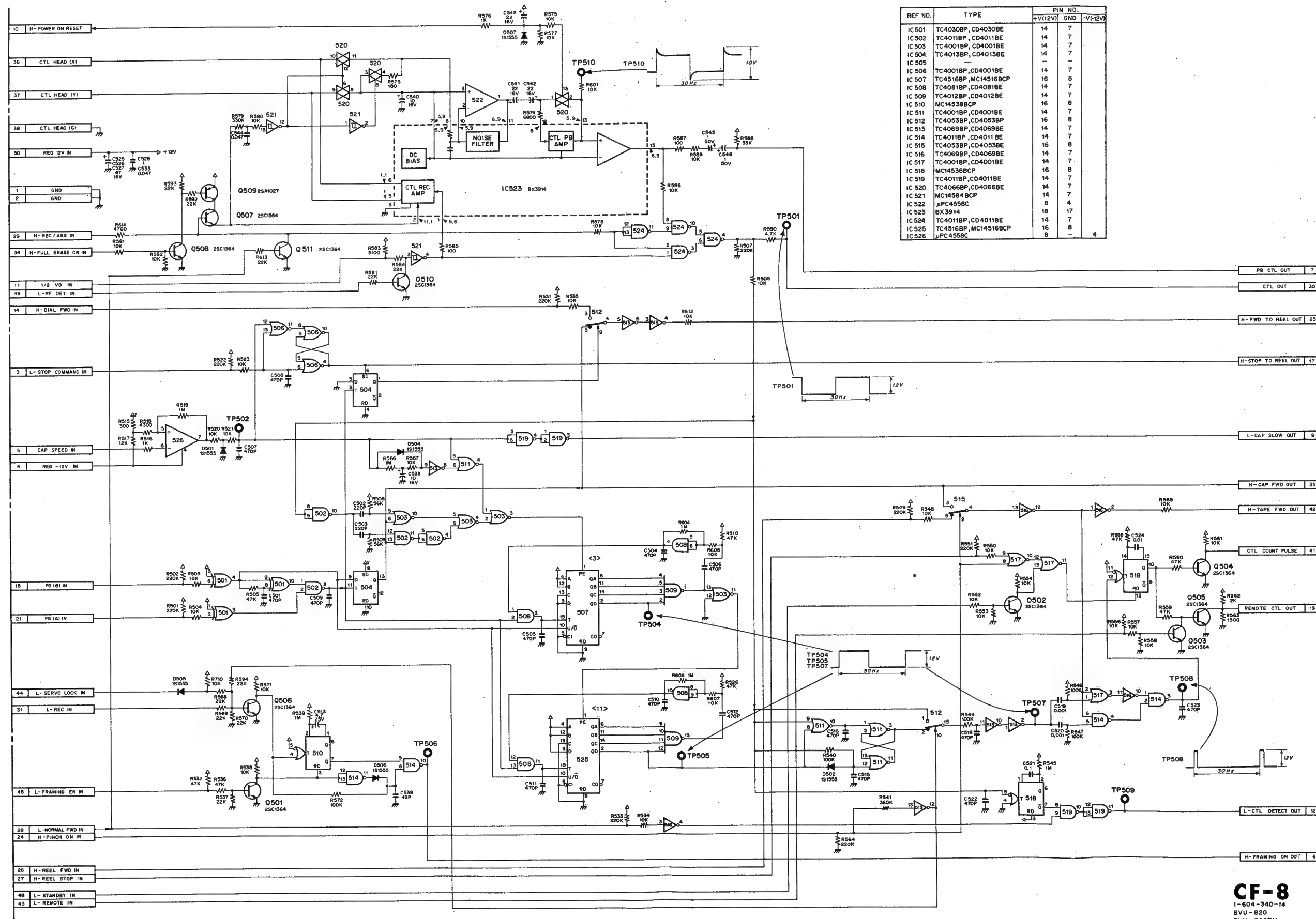
Q501 E-7  
Q502 F-3  
Q503 F-7  
Q504 F-7  
Q505 F-7  
Q506 E-7  
Q507 B-7  
Q508 B-7  
Q509 B-7  
Q510 C-6  
Q511 C-7

TP501 E-3  
TP502 C-6  
TP504 E-5  
TP505 D-5  
TP506 E-6  
TP507 D-7  
TP508 G-6  
TP509 D-6  
TP510 A-6

CF-8-SOLDERING SIDE-  
1-604-340-14  
BVU-820  
BVU-820PM

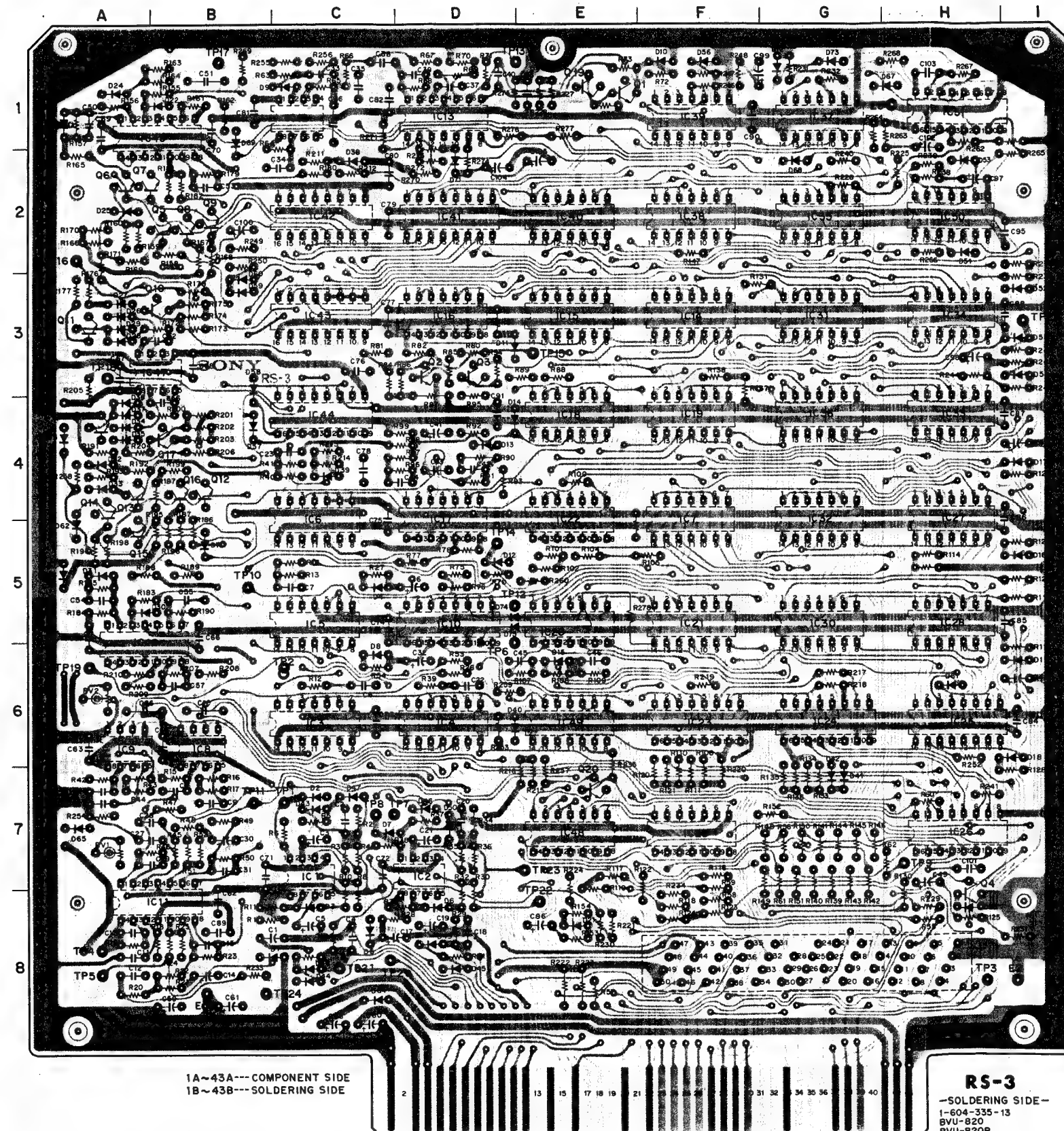


CF-8 (CTL REC PB AMPLIFIER)



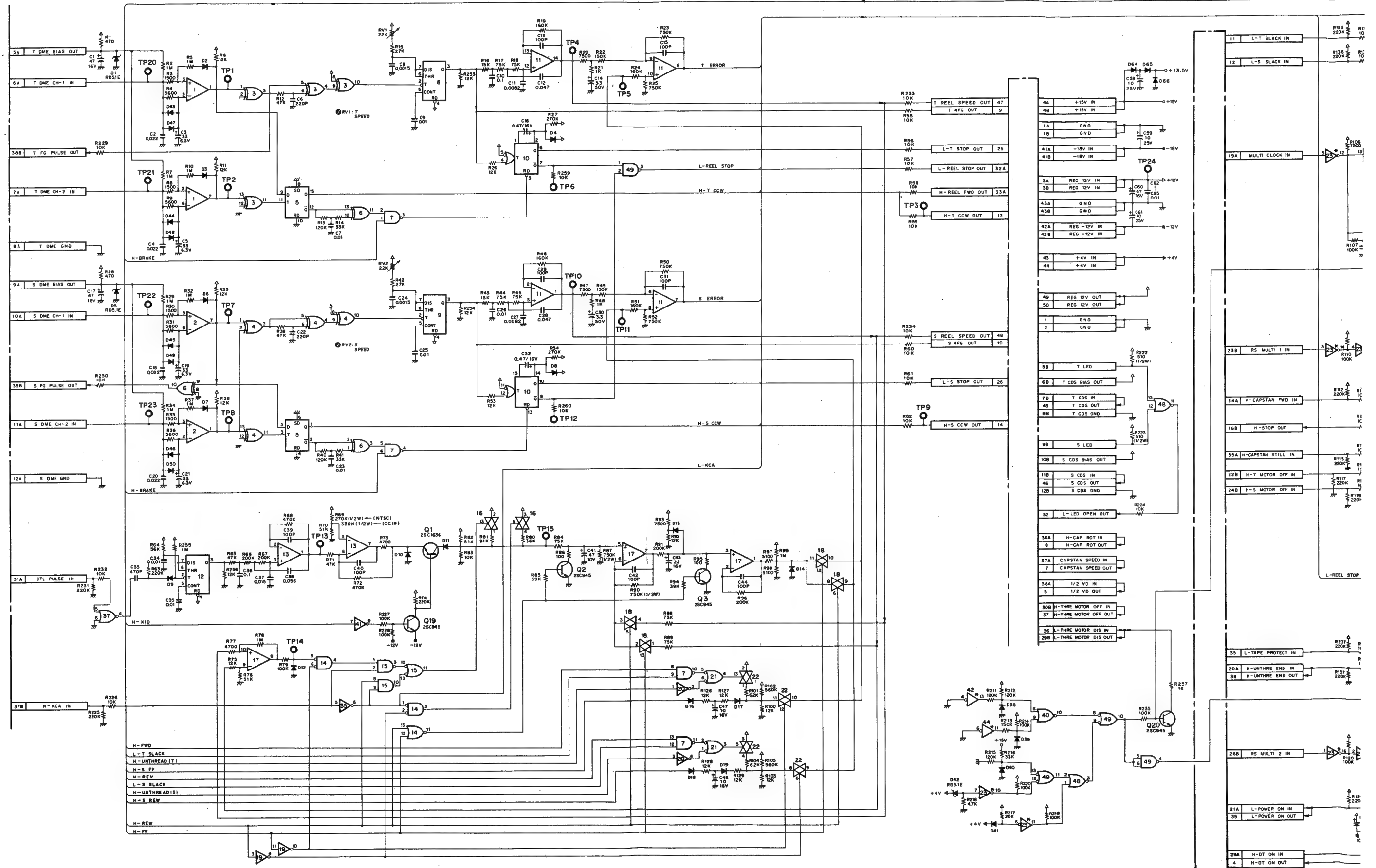
REF NO.	TYPE	PIN NO.
IC 501	TC4030BP, CD4030BE	14 7
IC 502	TC4011BP, CD4011BE	14 7
IC 503	TC4001BP, CD4001BE	14 7
IC 504	TC4013BP, CD4013BE	14 7
IC 505	—	—
IC 506	TC4001BP, CD4001BE	14 7
IC 507	TC4516BP, MC14516BCP	16 8
IC 508	TC4081BP, CD4081BE	14 7
IC 509	TC4012BP, CD4012BE	14 7
IC 510	MC14538CP	16 8
IC 511	TC4001BP, CD4001BE	14 7
IC 512	TC4053BP, CD4053BP	16 8
IC 513	TC4069BP, CD4069BE	14 7
IC 514	TC4011BP, CD4011BE	14 7
IC 515	TC4053BP, CD4053BE	16 8
IC 516	TC4069BP, CD4069BE	14 7
IC 517	TC4001BP, CD4001BE	14 7
IC 518	MC14538CP	16 8
IC 519	TC4011BP, CD4011BE	14 7
IC 520	TC4069BP, CD4069BE	14 7
IC 521	MC14584BCP	14 7
IC 522	μPC4558C	8 4
IC 523	BX3914	18 17
IC 524	TC4011BP, CD4011BE	14 7
IC 525	TC4516BP, MC14516BCP	16 8
IC 526	μPC4558C	8 4

RS-3 (REEL SERVO)



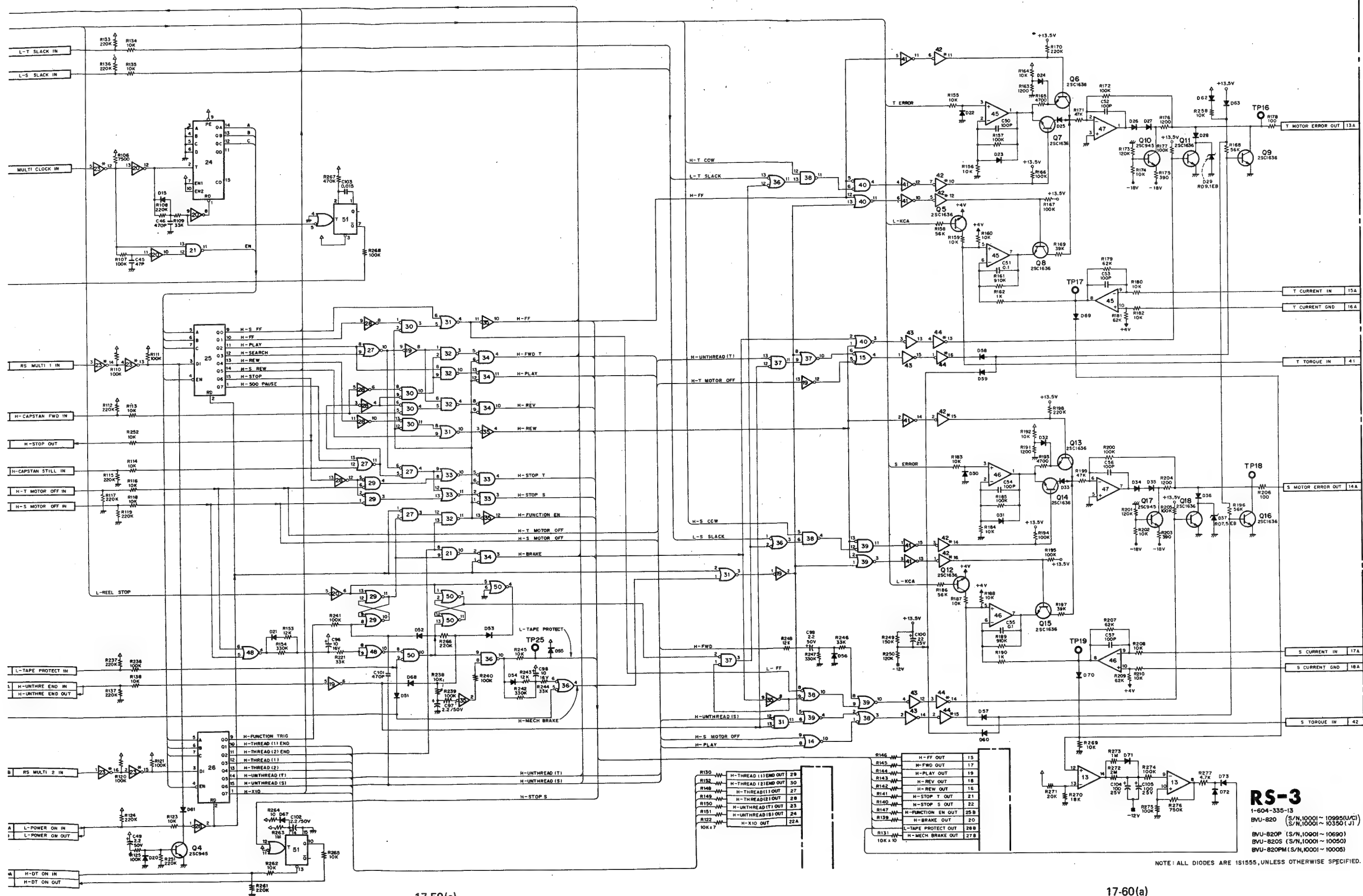
D1	C-8	IC1	C-7	RV1	A-7
D2	C-7	IC2	D-7	RV2	A-6
D3	C-8	IC3	C-6		
D4	C-6	IC4	D-6	TP1	C-7
D5	C-8	IC5	C-6	TP2	C-6
D6	D-8	IC6	C-6	TP3	H-8
D7	C-7	IC7	F-6	TP4	A-8
D8	C-6	IC8	B-6	TP5	A-8
D9	C-1	IC9	A-6	TP6	E-6
D10	F-1	IC10	D-5	TP7	D-7
D11	D-3	IC11	B-8	TP8	C-7
D12	D-5	IC12	C-1	TP9	H-7
D13	D-4	IC13	D-1	TP10	B-5
D14	E-4	IC14	F-3	TP11	B-7
D15	E-6	IC15	E-3	TP12	E-5
D16	I-5	IC16	D-3	TP13	E-1
D17	I-4	IC17	D-5	TP14	D-5
D18	I-6	IC18	E-4	TP15	E-3
D19	I-6	IC19	F-4	TP16	A-2
D20	H-8	IC20	E-5	TP17	B-1
D21	E-8	IC21	F-5	TP18	A-3
D22	B-1	IC22	E-5	TP19	A-6
D23	A-1	IC23	F-8	TP20	C-8
D24	A-1	IC24	G-8	TP21	C-8
D25	A-2	IC25	H-8	TP22	E-8
D26	A-3	IC26	H-7	TP23	E-7
D27	A-3	IC27	H-6	TP24	B-8
D28	A-3	IC28	H-5	TP25	I-3
D29	A-3	IC29	F-7		
D30	A-5	IC30	G-5		
D31	A-4	IC31	G-3		
D32	A-4	IC32	G-5		
D33	A-4	IC33	H-4		
D34	A-4	IC34	H-3		
D35	A-4	IC35	G-2		
D36	A-4	IC36	G-4		
D37	A-4	IC37	G-1		
D38	C-2	IC38	F-2		
D39	C-4	IC39	F-1		
D40	E-6	IC40	E-2		
D41	G-7	IC41	D-2		
D42	G-7	IC42	C-2		
D43	C-7	IC43	C-3		
D44	C-8	IC44	C-4		
D45	D-8	IC45	B-1		
D46	D-7	IC46	A-6		
D47	C-7	IC47	B-3		
D48	C-8	IC48	E-7		
D49	D-8	IC49	E-6		
D50	D-7	IC50	H-2		
D51	H-2				
D52	I-3	Q1	E-1		
D53	H-2	Q2	D-3		
D54	I-3	Q3	D-3		
D55	I-3	Q4	H-8		
D56	F-1	Q5	B-2		
D57	B-4	Q6	A-2		
D58	B-3	Q7	A-2		
D59	B-3	Q8	B-2		
D60	B-3	Q9	B-2		
D61	H-6	Q10	B-3		
D62	A-5	Q11	A-3		
D63	A-4	Q12	B-4		
D64	C-8	Q13	A-4		
D65	A-7	Q14	A-4		
D66	A-5	Q15	A-5		
D67	H-1	Q16	B-4		
D68	G-2	Q17	B-4		
D69	B-1	Q18	A-4		
D70	B-5	Q19	E-1		
D71	D-2	Q20	E-7		
D72	G-1				
D73	G-1				
D74	D-5				
D75	D-5				
E1	B-8				
E2	I-8				
E3	H-1				

PFF. NO.	TYPE	1V(H35V)+V(H2V)	GND	-V(-12V)-V(-16V)
IC 1	NJM2903D	8	4	
2	NJM2903D	8	4	
3	TC4030BP,CD4030BE	14	7	
4	TC4030BP,CD4030BE	14	7	
5	TC4030BP,CD4030BE	14	7	
6	TC4030BP,CD4030BE	14	7	
7	TC4011BP,CD4011BE	14	7	
8	NE555N,M51841P	8	1	
9	NE555N,M51841P	8	1	
10	MC14538BCP,HD14538BP	16	8	
11	μPC324C,LM324	4		11
12	NE555N,M51841P	8	1	
13	μPC324C,LM324	4		11
14	TC4001BP,CD4001BE	14	7	
15	TC4011BP,CD4011BE	14	7	
16	TC4066BP,CD4066BE	14	7	
17	μPC324C,LM324	4		11
18	TC4066BP,CD4066BE	14	7	
19	TC4069BP,CD4069BE	14	7	
20	TC4069BP,CD4069BE	14	7	
21	TC4011BP,CD4011BE	14	7	
22	TC4066BP,CD4066BE	14	7	
23	M54517P	8		
24	TC4016BP,CD4016BE	16	8	
25	TC4099BP,CD4099BE	16	8	
26	TC4099BP,CD4099BE	16	8	
27	TC4001BP,CD4001BE	14	7	
28	TC4069BP,CD4069BE	14	7	
29	TC4001BP,CD4001BE	14	7	
30	TC4001BP,CD4001BE	14	7	
31	TC4001BP,CD4001BE	14	7	
32	TC4011BP,CD4011BE	14	7	
33	TC4001BP,CD4001BE	14	7	
34	TC4001BP,CD4001BE	14	7	
35	TC4069BP,CD4069BE	14	7	
36	TC4011BP,CD4011BE	14	7	
37	TC4001BP,CD4001BE	14	7	
38	TC4011BP,CD4011BE	14	7	
39	TC4001BP,CD4001BE	14	7	
40	TC4001BP,CD4001BE	14	7	
41	TC5067BP	16	8	
42	M54519P	8		
43	TC5067BP	16	8	
44	M54519P	8		
45	μPC324C,LM324	4		11
46	μPC324C,LM324	4		11
47	μPC4559C,RC4558	8		4
48	TC4001BP,CD4001BE	14	7	
49	TC4011BP,CD4011BE	14	7	
50	TC4001BP,CD4001BE	14	7	
51	MC14538BCP	16	8	



17-58(a)

RS-3	RS-3
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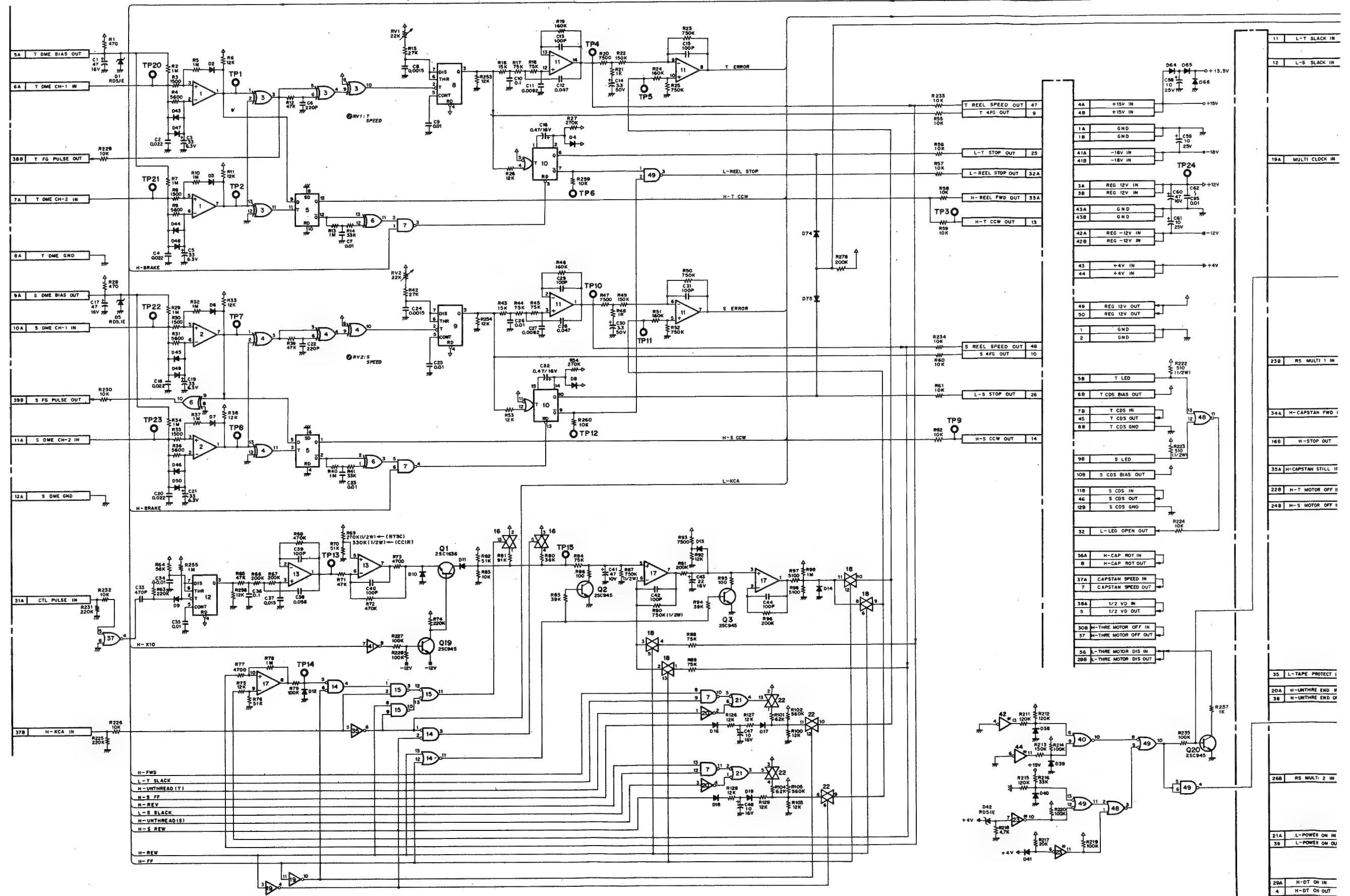
**RS-3**

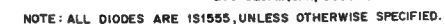
1-604-335-13  
BVU-820 (S/N,10001~10995(U/C)  
(S/N,10001~10350(J))  
BVU-820P (S/N,10001~10690)  
BVU-820S (S/N,10001~10050)  
BVU-820PM (S/N,10001~10005)

NOTE: ALL DIODES ARE 1S1555, UNLESS OTHERWISE SPECIFIED.



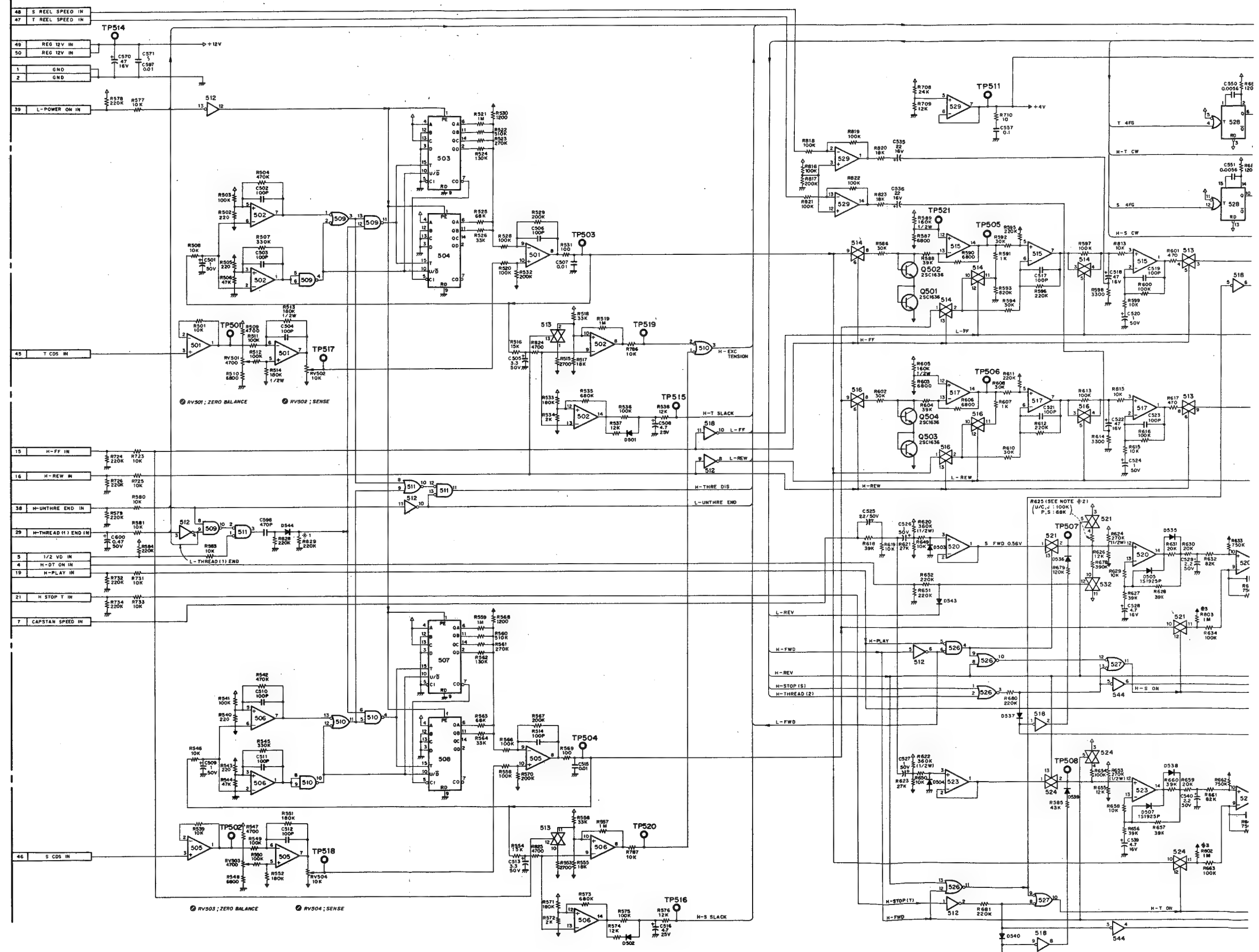
SER. NO. 10996 and higher (U/C)  
SER. NO. 10351 and higher (J)

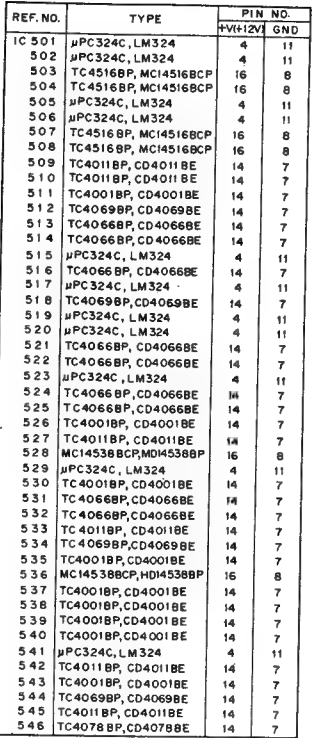




### RS-4 (TAPE TENSION SERVO)

NOTE		
MARK	CHANGE INFORMATION	SERIAL NO.
①	R219 1M → 220K	U/C : 10746 ~ J : 10201 ~ P : 10501 ~ S : 10051 ~ PM : 10006 ~
②	R23 100K → 68K (PAL, SECAM ONLY)	P : 10601 ~ S : 10051 ~
③	CHANGE R689 100K → 200K R694 100K → 200K R005 500K → 1M R008 500K → 1M C568 10/16V → 4.7/25V (R833/R254) (D548/D549) ADDITION R833 200K D548 IC827: Ⓢ-W → C553 HOT R834 200K D549 IC827: Ⓢ-W → C555 HOT	U/C : 10986 ~ J : 10061 ~ P : 10881 ~ S : 10051 ~ PM : 10006 ~
④	R644 270K → 200K R645 680K → 1M	U/C : 11196 ~ J : 10401 ~ P : 10731 ~ S : 10051 ~ PM : 10011 ~





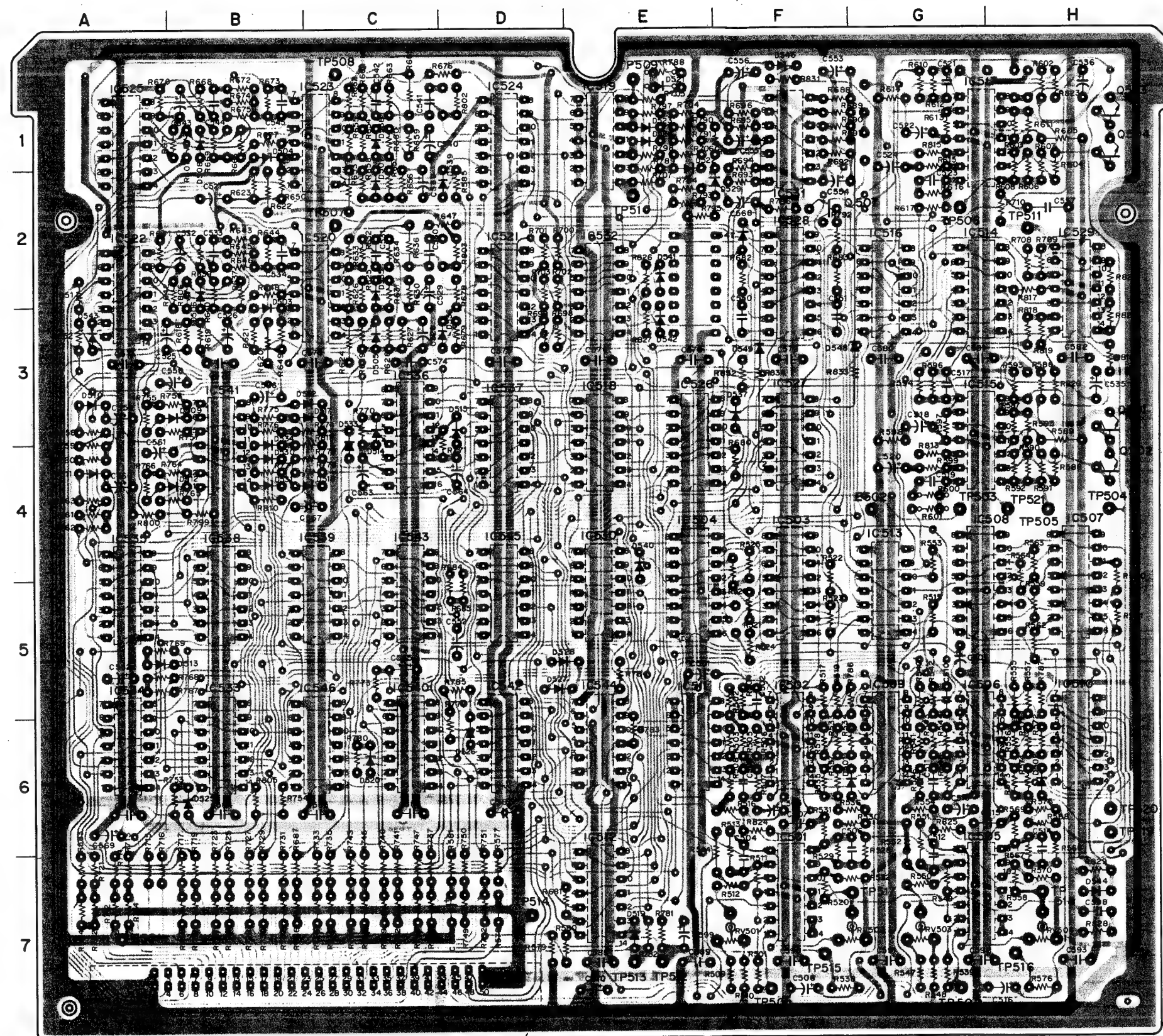
NOTE: ALL DIODES ARE 1S1555, UNLESS OTHERWISE SPECIFIED.

**RS-4**

1-604-336-13,14  
BVU - 820  
BVU - 820P  
BVU - 820S  
BVU - 820PM



RS-4 (TAPE TENSION SERVO)



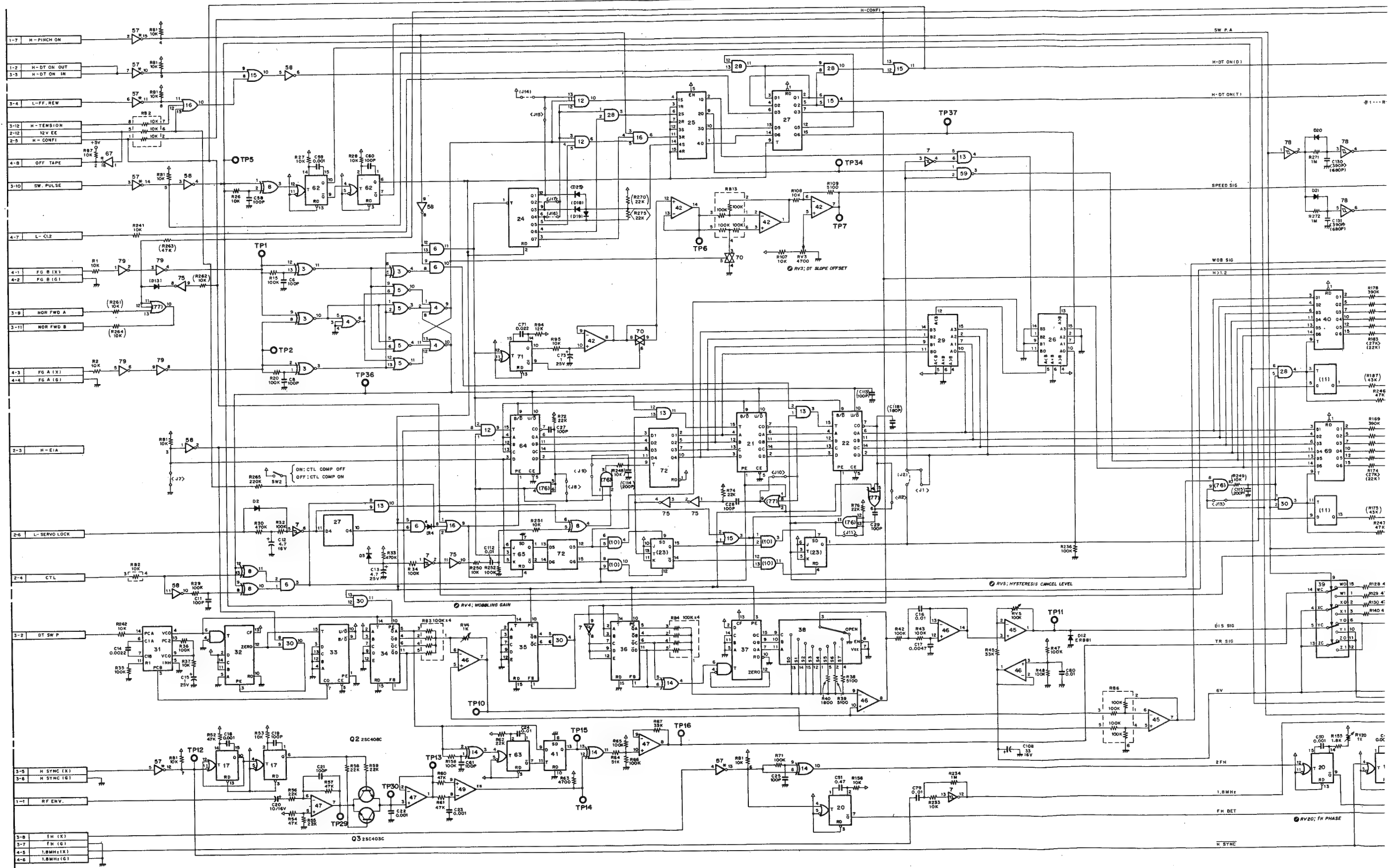
- |       |     |       |     |
|-------|-----|-------|-----|
| D501  | G-6 | IC521 | D-2 |
| D502  | H-6 | IC522 | A-2 |
| D503  | B-3 | IC523 | C-1 |
| D504  | B-1 | IC524 | D-1 |
| D505  | C-3 | IC525 | A-1 |
| D506  | B-2 | IC526 | E-3 |
| D507  | C-2 | IC527 | F-4 |
| D508  | B-1 | IC528 | F-2 |
| D509  | B-3 | IC529 | H-2 |
| D510  | A-3 | IC530 | E-5 |
| D511  | A-4 | IC531 | F-1 |
| D512  | B-4 | IC532 | E-2 |
| D513  | A-5 | IC533 | B-6 |
| D514  | C-3 | IC534 | A-6 |
| D515  | D-3 | IC535 | A-5 |
| D516  | C-4 | IC536 | C-3 |
| D517  | C-3 | IC537 | D-3 |
| D519  | E-7 | IC538 | B-5 |
| D520  | C-6 | IC539 | C-5 |
| D521  | E-1 | IC540 | C-6 |
| D522  | E-2 | IC541 | B-3 |
| D523  | E-1 | IC542 | D-6 |
| D524  | E-1 | IC543 | C-5 |
| D525  | B-6 | IC544 | E-6 |
| D526  | D-6 | IC545 | D-5 |
| D527  | D-5 | IC546 | C-6 |
| D528  | E-5 |       |     |
| D529  | F-2 | Q501  | H-3 |
| D530  | B-4 | Q502  | H-4 |
| D531  | B-4 | Q503  | H-1 |
| D532  | C-3 | Q504  | H-1 |
| D533  | C-4 | Q507  | F-2 |
| D534  | B-4 |       |     |
| D535  | C-2 | RV501 | F-7 |
| D536  | D-3 | RV502 | G-7 |
| D537  | F-3 | RV503 | G-7 |
| D538  | C-1 | RV504 | H-7 |
| D539  | D-2 |       |     |
| D540  | E-4 | TP501 | F-7 |
| D541  | E-2 | TP502 | G-7 |
| D542  | E-3 | TP503 | G-4 |
| D543  | A-3 | TP504 | H-4 |
| D544  | H-7 | TP505 | H-4 |
| D546  | F-1 | TP506 | G-2 |
| D547  | F-2 | TP507 | C-2 |
| D548  | G-3 | TP508 | C-1 |
| D549  | F-3 | TP509 | E-1 |
|       |     | TP510 | E-2 |
| E501  | A-7 | TP511 | H-2 |
| E502  | G-4 | TP512 | E-7 |
|       |     | TP513 | E-7 |
|       |     | TP514 | D-7 |
|       |     | TP515 | F-7 |
|       |     | TP516 | H-7 |
|       |     | TP517 | G-7 |
|       |     | TP518 | H-7 |
|       |     | TP519 | H-6 |
|       |     | TP520 | H-6 |
|       |     | TP521 | H-4 |
| IC501 | F-7 |       |     |
| IC502 | F-6 |       |     |
| IC503 | F-5 |       |     |
| IC504 | E-5 |       |     |
| IC505 | G-7 |       |     |
| IC506 | G-6 |       |     |
| IC507 | H-5 |       |     |
| IC508 | G-5 |       |     |
| IC509 | G-6 |       |     |
| IC510 | H-6 |       |     |
| IC511 | E-6 |       |     |
| IC512 | E-7 |       |     |
| IC513 | G-5 |       |     |
| IC514 | G-2 |       |     |
| IC515 | G-4 |       |     |
| IC516 | G-2 |       |     |
| IC517 | G-1 |       |     |
| IC518 | E-3 |       |     |
| IC519 | E-1 |       |     |
| IC520 | C-2 |       |     |

**RS-4 - SOLDERING SIDE -**  
 1-604-336-13,14  
 BVU-820  
 BVU-820P  
 BVU-820S  
 BVU-820PM

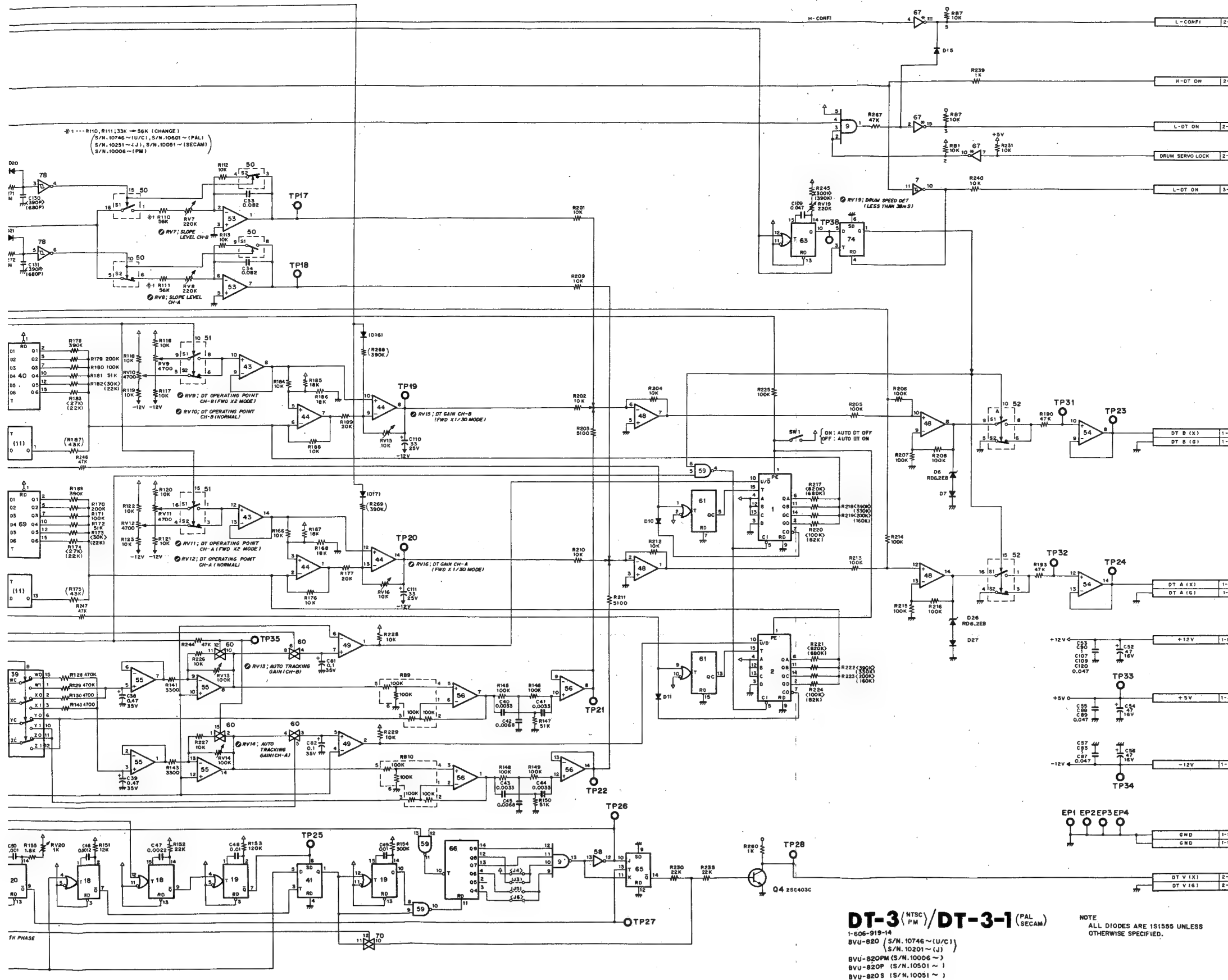


DT-3 (DYNAMIC TRACKING CONTROL)

Serial No. 10201 and higher (J)  
Serial No. 10746 and higher (U/C)



# DT-3 DT-3



NOTE: DIFFERENCE BETWEEN NTSC, PM AND PAL, SECAM SYSTEMS

- (1) O = Mounted, X = Not mounted (open)
- (2) The parts with mark ( ) in the schematic diagram are only for the NTSC, PM systems.
- (3) The parts with mark ( ) in the schematic diagram are only for the PAL, SECAM systems

SYSTEM	NTSC	PAL	SECAM	SYSTEM	NTSC	PAL	SECAM
REF. NO.				REF. NO.			
C113	X	O	J14	X			
C114	X	O	J15	X			
C115	X	O	J16	X			
C118	X	O	J17	X			
C130	390P	680P					
C131	390P	680P					
D13	X	O	R173	30K	22K		
D16	X	O	R174	27K	22K		
D17	X	O	R175	X			
D18	X	O	R182	30K	22K		
D19	X	O	R183	27K	22K		
D25	O	X	R187	X			
IC10	X	O	R217	820K	680K		
IC11	X	O	R218	390K	330K		
IC23	X	O	R219	200K	160K		
IC26	X	O	R220	100K	82K		
IC77	X	O	R221	820K	680K		
			R222	390K	300K		
			R223	200K	160K		
			R224	100K	82K		
J1	O	X					
J2	X	O					
J3	X	O	R245	300K	390K		
J4	O	X	R246	X			
J5	X	O	R249	X			
J6	O	X	R251	X			
J7	O	X	R262	X			
J8	O	X	R263	X			
J9	O	X	R264	X			
J10	O	X	R268	X			
J11	O	X	R269	X			
J12	O	X	R270	X			
J13	O	X	R275	O	X		

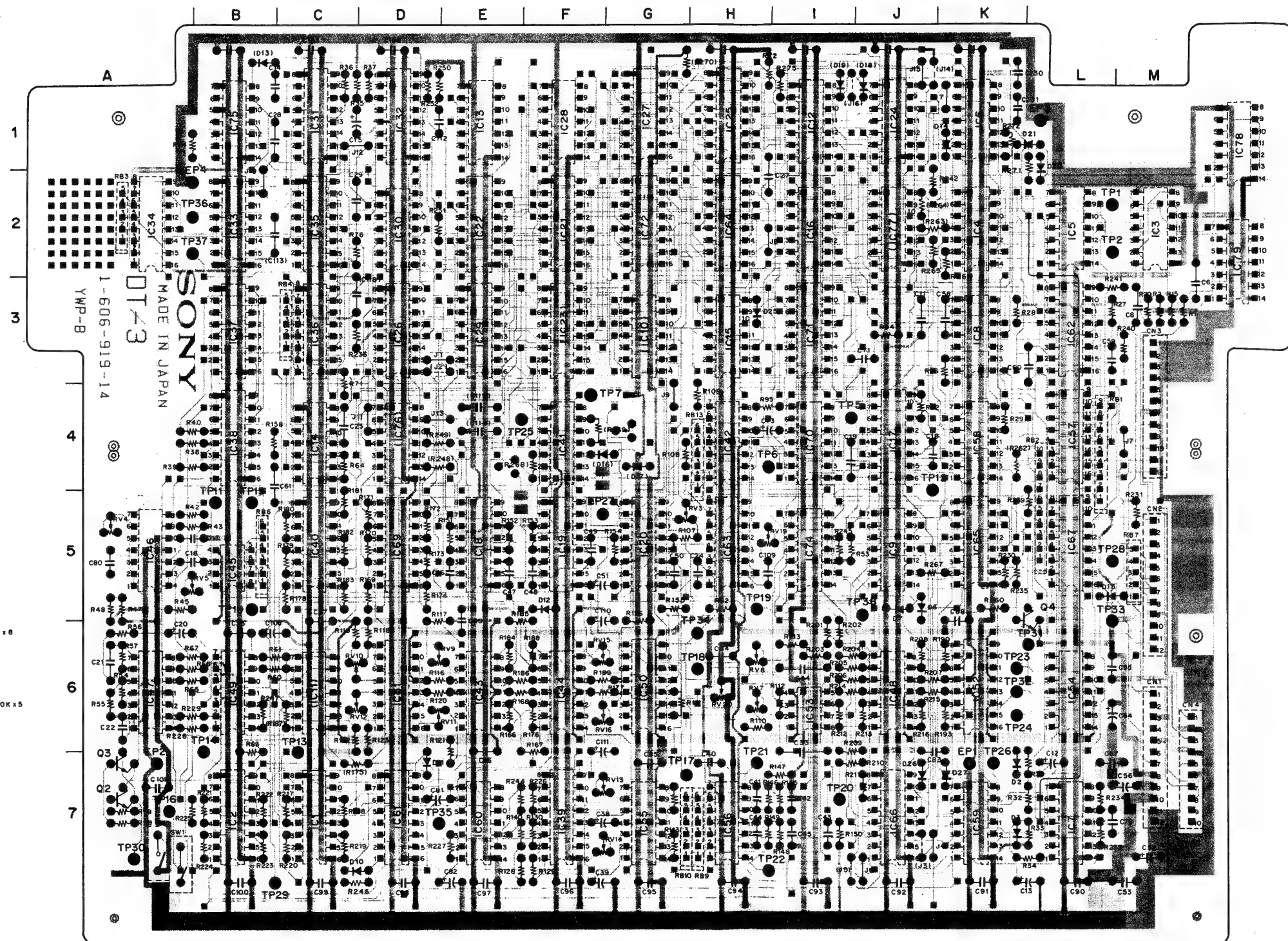
REF. NO.	TYPE	PIN NO.
IC 1	TC4516BP, MC14516BCP	16
IC 2	TC4516BP, MC14516BCP	16
IC 3	MC14077BCP, CD4077BE	14
IC 4	TC4025BP, CD4025BE	14
IC 5	TC4001BP, CD4001BE	14
IC 6	TC4081BP, CD4081BE	14
IC 7	MC14584BCP	14
IC 8	TC4030BP, CD4030BE	14
IC 9	TC4082BP, CD4082BE	14
IC 10	TC4081BP, CD4081BE	14
IC 11	TC4013BP, CD4013BE	14
IC 12	TC4073BP, CD4073BE	14
IC 13	TC4081BP, CD4081BE	14
IC 14	TC4030BP, CD4030BE	14
IC 15	TC4071BP, CD4071BE	14
IC 16	TC4075BP, CD4075BE	14
IC 17	TP4528CP, MC14528BCP	16
IC 18	HD14538BP	16
IC 19	HD14538BP	16
IC 20	HD14538BP	16
IC 21	TC4029BP, CD4029BE	16
IC 22	TC4029BP, CD4029BE	16
IC 23	TC4027BP, CD4027BE	16
IC 24	TC4024BP, CD4024BE	14
IC 25	TC4043BP, CD4043BE	16
IC 26	TC4085BP, MC14585BCP	16
IC 27	TC4017BP, MC1417BCP	16
IC 28	TC4081BP, CD4081BE	14
IC 29	TC4085BP, MC14585BCP	16
IC 30	TC4081BP, CD4081BE	14
IC 31	MC14046BCP, CD4046BE	16
IC 32	MC14526BCP	16
IC 33	TC4029BP, CD4029BE	16
IC 34	TC4018BP, CD4018BE	16
IC 35	TC4018BP, CD4018BE	16
IC 36	TC4018BP, CD4018BE	16
IC 37	MC14526BCP	16
IC 38	TC4051BP, CD4051BE	16
IC 39	MC14518CP	16
IC 40	TC4017BP, MC1417BCP	16
IC 41	TC4013BP, CD4013BE	14
IC 42	μPC324C, LM324	4
IC 43	μPC324C, LM324	4
IC 44	μPC324C, LM324	4
IC 45	μPC4558C, RC4558	8
IC 46	μPC324C, LM324	4
IC 47	μPC324C, LM324	4
IC 48	μPC324C, LM324	4
IC 49	NJ4290IN	3
IC 50	TL191CN	11
IC 51	TL191CN	11
IC 52	TL191CN	11
IC 53	μPC4558C, RC4558	8
IC 54	μPC324C, LM324	4
IC 55	μPC324C, LM324	4
IC 56	μPC324C, LM324	4
IC 57	M54517P	8
IC 58	TC4069BP, CD4069BE	14
IC 59	TC4011BP, CD4011BE	14
IC 60	TC4068BP, CD4068BE	14
IC 61	TC4520BP, MC14520BCP	16
IC 62	TP4528CP, MC14528BCP	16
IC 63	HD14538BP	16
IC 64	TC4029BP, CD4029BE	16
IC 65	TC4027BP, CD4027BE	16
IC 66	TC4040BP, CD4040BE	16
IC 67	M54517P	8
IC 68	TL191CN	11
IC 69	TC4017BP, MC1417BCP	16
IC 70	TC4068BP, CD4068BE	14
IC 71	MC14538BCP	16
IC 72	TC4017BP, MC1417BCP	16
IC 73	μPC324C, LM324	4
IC 74	TC4013BP, CD4013BE	14
IC 75	MC14584BCP	14
IC 76	TC4081BP, CD4081BE	14
IC 77	TC4075BP, CD4075BE	14
IC 78	MC14584BCP	14
IC 79	MC14584BCP	14



# DT-3 DT-3

DT-3 (DYNAMIC TRACKING CONTROL)

Serial No. 10201 and higher (J)  
Serial No. 10746 and higher (U/C)



CN1 M-7	IC56 H-7	TP36 B-2
CN2 M-5	IC57 L-4	TP37 A-2
CN3 M-4	IC58 K-4	TP38 J-5
CN4 M-7	IC59 K-7	
	IC60 E-7	
D2 K-7	IC61 D-7	
D3 K-7	IC62 L-3	
D6 J-5	IC63 H-5	
D7 J-5	IC64 H-2	
D10 D-7	IC65 K-5	
D11 D-7	IC66 J-7	
D12 F-5	IC67 L-5	
(D13 B-1)	IC69 D-5	
D14 K-1	IC70 I-4	
D15 L-5	IC71 I-3	
(D16 F-4)	IC72 G-2	
(D17 G-4)	IC74 I-5	
(D18 J-1)	IC75 B-1	
(D19 I-1)	(IC76 D-4)	
D20 L-1	(IC77 J-2)	
D21 L-1	IC78 M-1	
D25 I-1		
D25 H-3	Q2 A-7	
D26 J-7	Q3 A-7	
D27 K-7	Q4 L-5	
EP1 K-7	RB1 L-4	
EP2 A-7	RB2 L-5	
EP3 L-1	RB3 A-2	
EP4 A-2	RB4 C-3	
	RB6 B-5	
IC1 C-7	RB7 M-5	
IC2 B-7	RB8 H-7	
IC3 M-2	RB10 G-7	
IC4 K-2	RB13 H-4	
IC5 L-2		
IC6 K-1	RV3 G-5	
IC7 L-7	RV4 A-5	
IC8 K-3	RV5 A-5	
IC9 J-5	RV7 H-6	
(IC10 G-3)	RV8 H-6	
(IC11 C-6)	RV9 D-6	
IC12 I-1	RV10 C-6	
IC13 E-1	RV11 D-6	
IC14 C-4	RV12 C-6	
IC15 H-3	RV13 F-7	
IC16 I-2	RV14 F-7	
IC17 J-4	RV15 F-6	
IC18 E-5	RV16 F-6	
IC19 F-5	RV19 H-5	
IC20 G-5	RV20 H-6	
IC21 F-2		
IC22 E-2	SW1 A-7	
(IC23 F-3)	SW2 A-7	
IC24 J-1		
IC25 H-1	TP1 M-2	
IC26 D-3	TP2 M-2	
IC27 G-1	TP5 I-4	
IC28 F-1	TP6 H-4	
IC29 E-3	TP7 F-4	
IC30 D-2	TP10 B-5	
IC31 C-1	TP11 B-5	
IC32 D-1	TP12 J-4	
IC33 B-2	TP13 C-7	
IC34 A-2	TP14 B-7	
IC35 C-2	TP15 B-6	
IC36 C-3	TP16 A-7	
IC37 B-3	TP17 H-7	
IC38 B-4	TP18 H-6	
IC39 F-7	TP19 H-5	
IC40 C-5	TP20 I-7	
IC41 F-4	TP21 H-7	
IC42 H-4	TP22 H-7	
IC43 E-6	TP23 K-6	
IC44 F-6	TP24 K-6	
IC45 B-5	TP25 E-4	
IC46 A-5	TP26 K-7	
IC47 A-6	TP27 F-5	
IC48 J-6	TP28 M-5	
IC49 B-6	TP29 B-7	
IC50 G-6	TP30 A-7	
IC51 D-6	TP31 L-6	
IC52 K-6	TP32 K-6	
IC53 I-6	TP33 L-6	
IC54 L-6	TP34 H-6	
IC55 G-7	TP35 D-7	

NOTE:  
( ) = NOT MOUNTED NTSC/PM MACHINE  
C113 D13 IC10 J2 R175 R262  
C114 D16 IC11 J3 R187 R263  
C115 D17 IC23 J5 R248 R264  
C118 D18 IC76 J14 R249 R268  
D19 IC77 J16 R261 R269  
R270

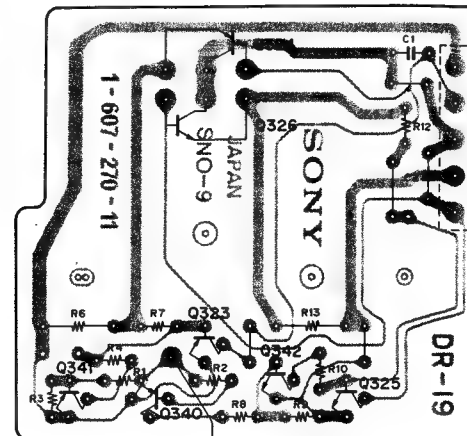
DT-3 —SOLDERING SIDE—  
1-606-919-14  
BVU-820 (S/N. 10746 ~ (U/C))  
S/N. 10201 ~ (J)  
BVU-820PM (S/N. 10006 ~ )

PD-19, PD-15, PD-17, PD-21, DR-9, DR-19

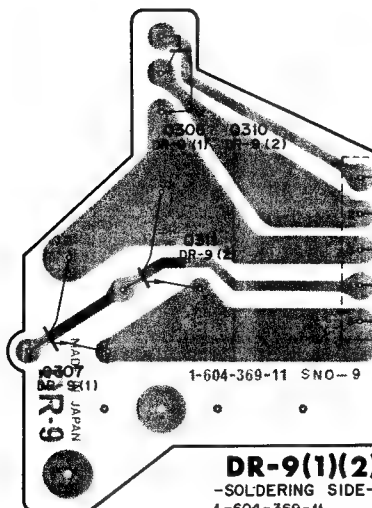
PD-19, PD-15, PD-17, PD-21, DR-9, DR-19

PD-19, PD-15, PD-17, PD-21, DR-9, DR-19 (POWER DRIVE)  
(POWER SUPPLY)

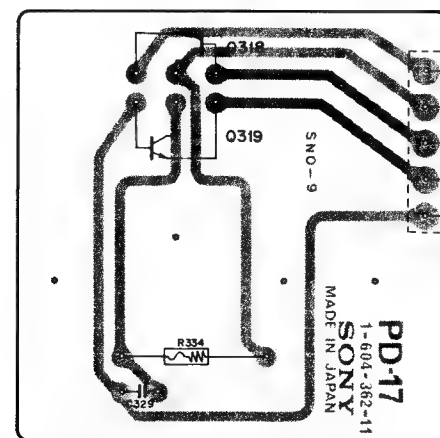
Serial No. 10746 to 10895 (U/C)  
Serial No. 10201 to 10350 (J)



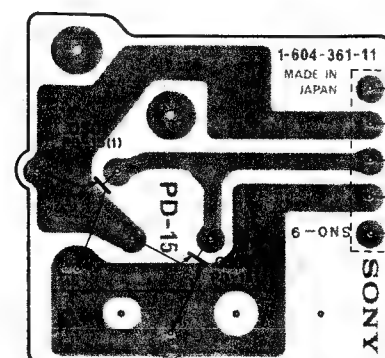
**DR-19**  
-SOLDERING SIDE-  
1-607-270-11



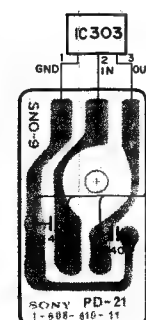
**DR-9(1)(2)**  
-SOLDERING SIDE-  
1-604-369-11



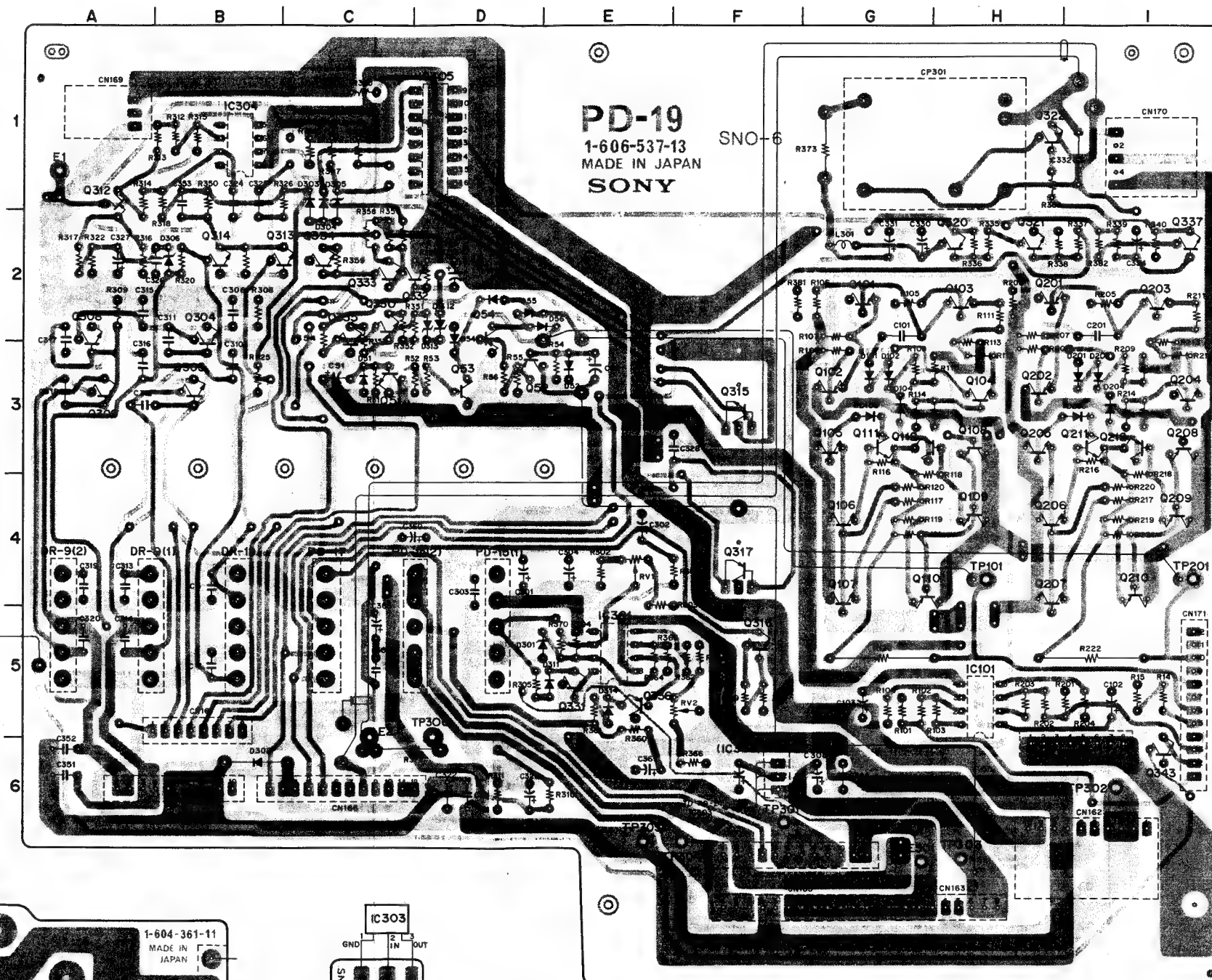
**PD-17**-SOLDERING SIDE-  
1-604-362-11



**PD-15(1)(2)**  
-SOLDERING SIDE-  
1-604-361-11



**PD-21**  
-SOLDERING SIDE-  
1-608-010-11



CN161 I-6	D102 G-3	IC101 H-5	O112 G-3	Q316 F-5	TP101 H-4
CN162 I-6	D103 G-3	IC101 E-5	O201 H-2	Q317 F-4	TP201 I-4
CN163 H-6	D104 G-3	IC303 (G-6)	O202 H-3	Q320 H-2	TP301 F-6
CN164 F-6	D201 I-3	IC304 B-1	O203 I-2	Q321 H-2	TP302 I-6
CN165 F-6	D202 I-3	IC305 D-1	O204 I-3	Q322 H-1	TP303 H-6
CN166 C-6	D203 I-3		O205 H-3	Q330 C-2	TP304 F-6
CN167 B-5	D204 I-3	Q51 C-3	O206 H-4	Q331 E-5	TP305 E-6
CN168 B-6	D301 E-5	Q52 D-3	O207 H-4	Q332 D-2	TP306 D-5
CN169 A-1	D302 B-6	Q53 D-3	O208 I-3	Q333 C-2	
CN170 I-1	D303 C-1	Q54 D-2	O209 I-4	Q334 C-2	
CN171 I-5	D304 C-1	Q101 G-2	O210 I-4	Q335 C-2	
CP301 H-1	D305 C-1	Q102 G-3	O211 I-3	Q336 E-5	
	D306 B-2	Q103 H-2	O212 I-3	Q337 I-2	
	D311 E-5	Q104 H-3	Q304 B-2	Q343 I-6	
	D312 D-2	Q105 G-3	Q305 B-3		
D51 C-3	D313 D-2	Q106 G-4	Q308 A-2		
D53 D-2	D314 E-5	Q107 G-4	Q309 A-3		
D54 D-2		Q108 H-3	Q312 A-1		
D55 D-2	E1 A-1	Q109 H-4	Q313 C-2		
D56 E-2	E2 C-5	Q110 G-4	Q314 B-2		
D101 G-3	E301 G-6	Q111 G-3	Q315 F-3		

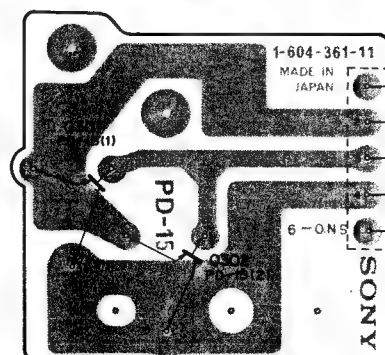
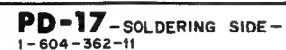
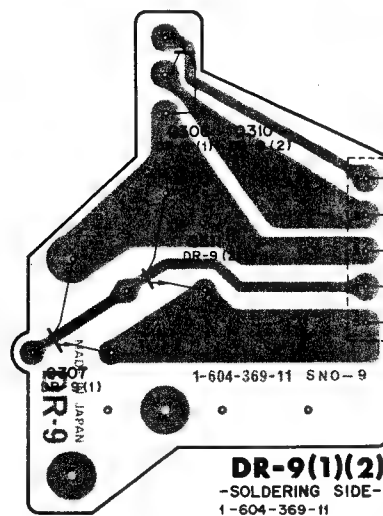
**PD-19**-SOLDERING SIDE-  
1-608-537-13  
BVU-820 (S/N.10746 ~ 10895 (U/C))  
BVU-820P (S/N.10201 ~ 10350 (J))  
BVU-820P (S/N.10501 ~ 10650 (P))



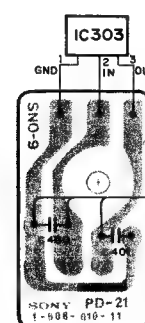


**PD-19, PD-15, PD-17, PD-21, DR-9, DR-19**

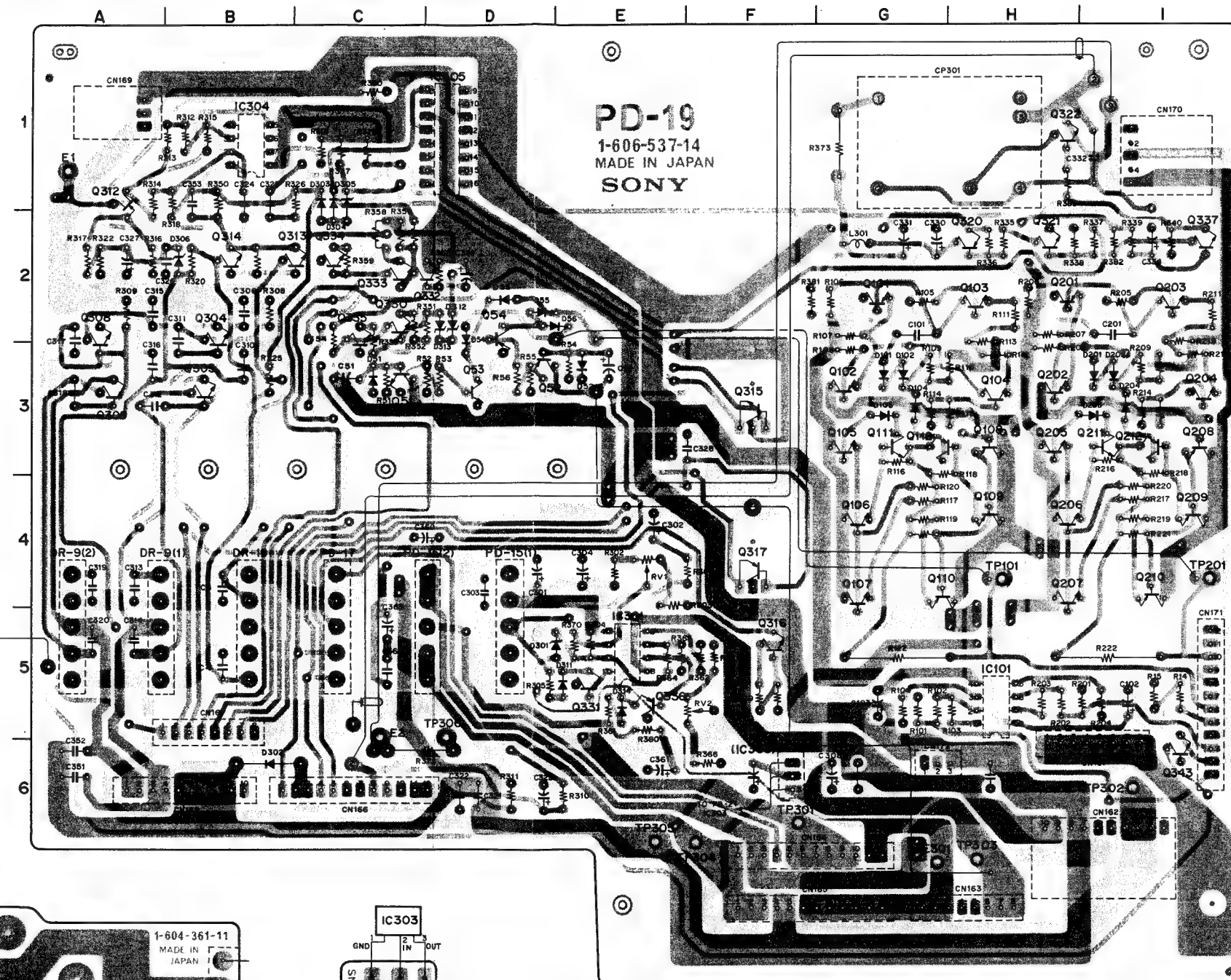
Serial No. 10896 and higher (U/C)
Serial No. 10351 and higher (J)



**PD-15(1)(2)**  
— SOLDERING SIDE —  
1-604-361-11



**PD-21**  
-SOLDERING  
SIDE-  
1-608-010-11



CN181	I - 6	D102	G - 3	IC101	H - 5	Q112	G - 3	Q316	F - 5	TP101	H - 4
CN182	I - 6	D103	G - 3	IC301	E - 5	Q201	H - 2	Q317	F - 4	TP201	I - 4
CN183	H - 6	D104	G - 3	IC303	(G - 6)	Q202	H - 3	Q320	H - 2	TP301	F - 6
CN184	F - 6	D201	I - 3	IC304	B - 1	Q203	I - 2	Q321	H - 2	TP302	I - 6
CN185	F - 6	D202	I - 3	IC305	D - 1	Q204	I - 3	Q322	H - 1	TP303	H - 6
CN186	C - 6	D203	I - 3			Q205	H - 3	Q330	C - 2	TP304	F - 6
CN187	B - 5	D204	I - 3	O51	C - 3	Q206	H - 4	Q331	E - 5	TP305	E - 6
CN188	B - 6	D301	E - 5	O52	D - 3	Q207	H - 4	Q332	D - 2	TP306	D - 5
CN189	A - 1	D302	B - 6	O53	D - 3	Q208	I - 3	Q333	C - 2		
CN170	I - 1	D303	C - 1	O54	D - 2	Q209	I - 4	Q334	C - 2		
CN171	I - 5	D304	C - 1	Q101	G - 2	Q210	I - 4	Q335	C - 2		
CN172	G - 6	D305	C - 1	O102	G - 3	Q211	I - 3	Q336	E - 5		
		D306	B - 2	O103	H - 2	Q212	I - 3	Q337	I - 2		
CP301	H - 1	D311	E - 5	O104	H - 3	Q304	B - 2	Q343	I - 6		
		D312	D - 2	O105	G - 3	Q305	B - 3				
D51	C - 3	D313	D - 2	O106	G - 4	Q308	A - 2	RV1	E - 4		
D52	E - 3	D314	E - 5	O107	G - 4	Q309	A - 3	RV2	F - 5		
D53	D - 2			O108	H - 3	Q312	A - 1				
D54	D - 2	E1	A - 1	O109	H - 4	Q313	C - 2				
D55	D - 2	E2	C - 5	O110	G - 4	Q314	B - 2				
D56	E - 2	E301	G - 6	Q111	G - 3	Q315	F - 3				
O101	G - 3										

**PD-19 — SOLDERING SIDE—**  
**1-606-537-14**  
 BVU-820      (S/N.10896 ~ (U/C))  
                 (S/N.10351 ~ (J))  
 BVU-820P    (S/N.10651 ~ )  
 BVU-820S    (S/N.10051 ~ )  
 BVU-820PM   (S/N.10006 ~ )

17-76(b)

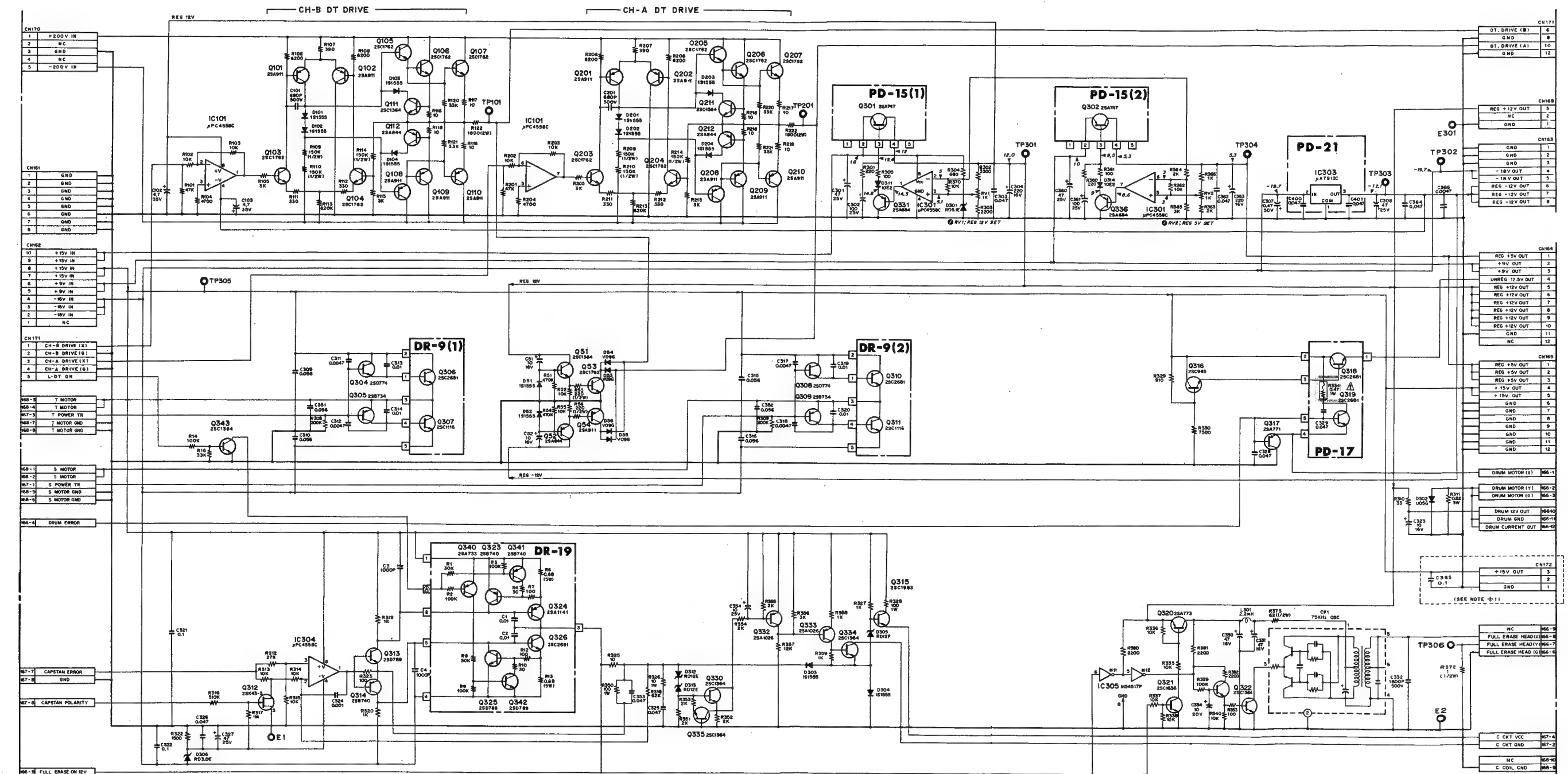
**PD-19 -SOLDERING SIDE-**  
1-606-537-14

BVU-820	(S/N.10896 ~ (U/C))
	(S/N.10351 ~ (J))
BVU-820P	(S/N.10651 ~ )
BVU-820S	(S/N.10051 ~ )
BVU-820PM	(S/N.10006 ~ )



PD-19, PD-15, PD-17, PD-21, DR-9, DR-19 (POWER DRIVE)  
(POWER SUPPLY)

Serial No. 10746 and higher (U/C)  
Serial No. 10201 and higher (J)



NOTE	CHANGE INFORMATION	SERIAL NO.
1	CH172 ADD	10896 ~ (U/C)
	C385 0.1 ADD	10331 ~ (J)
		10651 ~ (P)
		10091 ~ (S)
		10006 ~ (PM)
2	C386 0.0047 ADD	11886 ~ (U/C)
		10801 ~ (J)
		11386 ~ (P)
		10086 ~ (S)
		10081 ~ (PM)

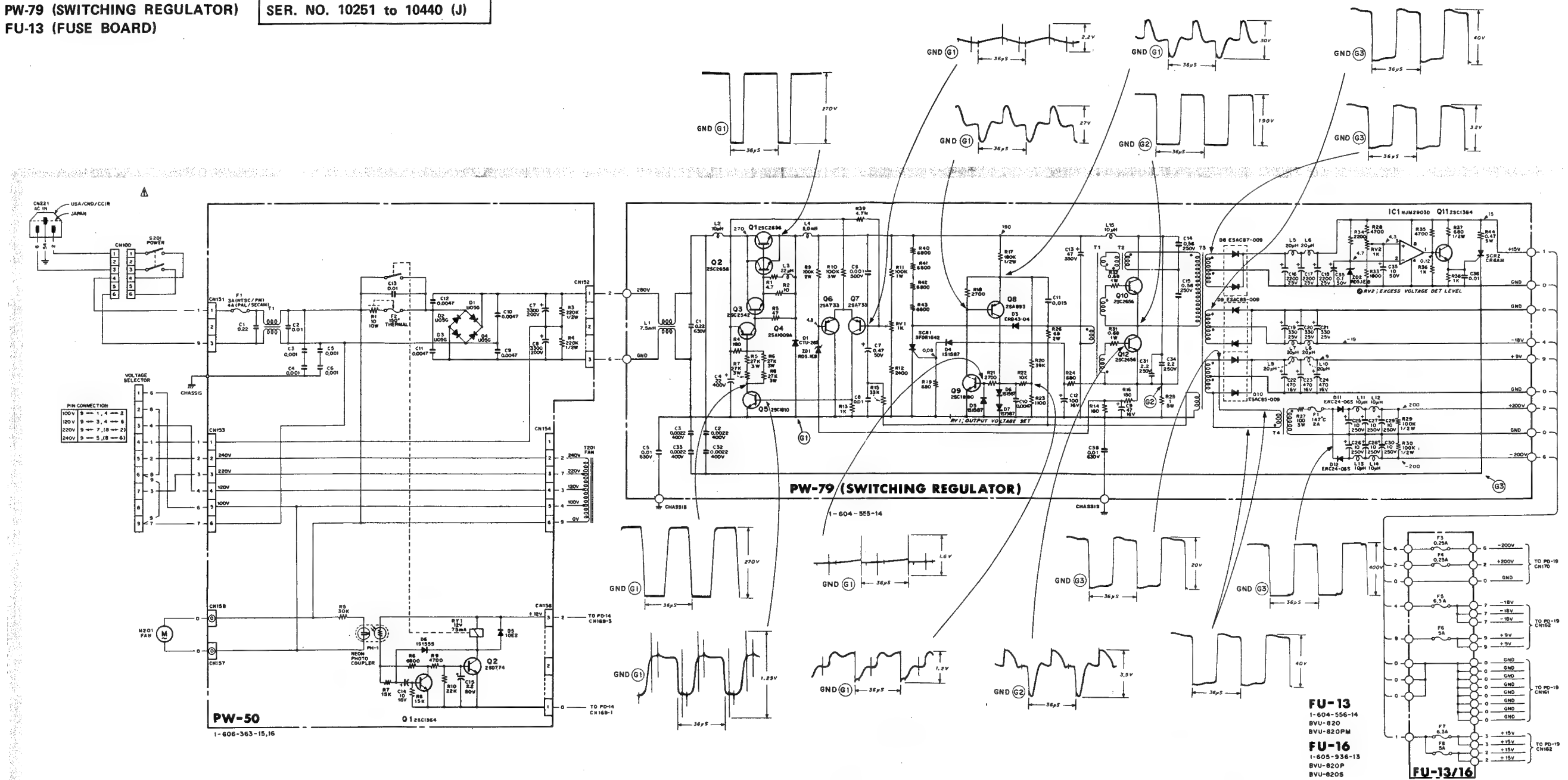
The shaded and  $\Delta$ -marked components are critical to safety.  
Replace only with same components as specified.

# PD-19

1-606-537-13,14  
BVU-820 (S/N.10746 ~ (U/C))  
BVU-820P (S/N.10301 ~ (J))  
BVU-820S (S/N.10051 ~ (S))  
BVU-820PM (S/N.10006 ~ (PM))

PW-50, (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-13 (FUSE BOARD)

SER. NO. 10746 to 11375 (U/C)  
SER. NO. 10251 to 10440 (J)



BVU-820 (S/N. 10746~11375 (U/C))  
S/N. 10251~10440 (J)  
BVU-820P (S/N. 10601~11230)  
BVU-820S (S/N. 10051~10060)  
BVU-820PM (S/N. 10006~10010)

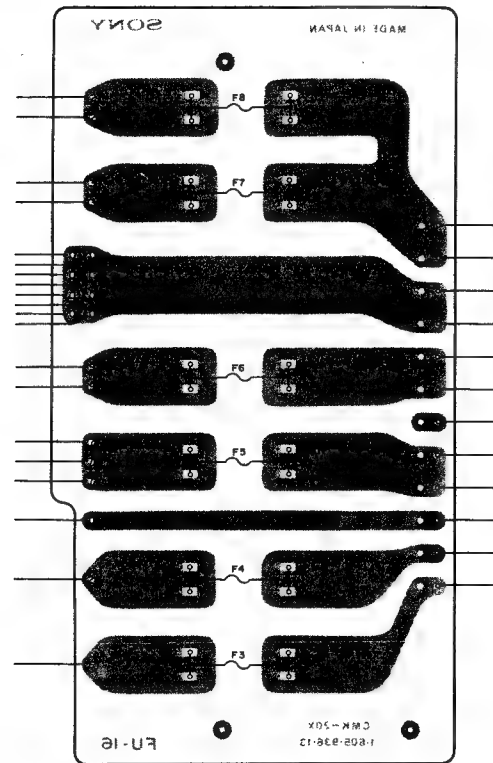
The shaded and  $\Delta$ -marked components are critical to safety.  
Replace only with same components as specified.

PW-50, PW-79, FU-13

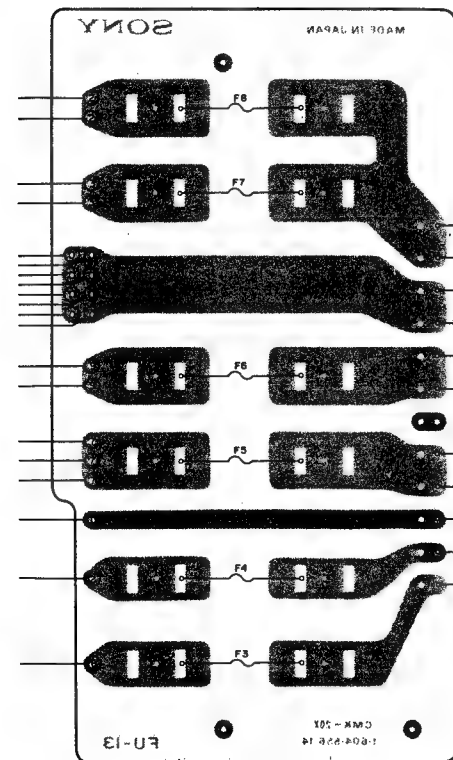
PW-50, PW-79, FU-13

PW-50, (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-13 (FUSE BOARD)

SER. NO. 10746 to 11375 (U/C)  
SER. NO. 10251 to 10440 (J)

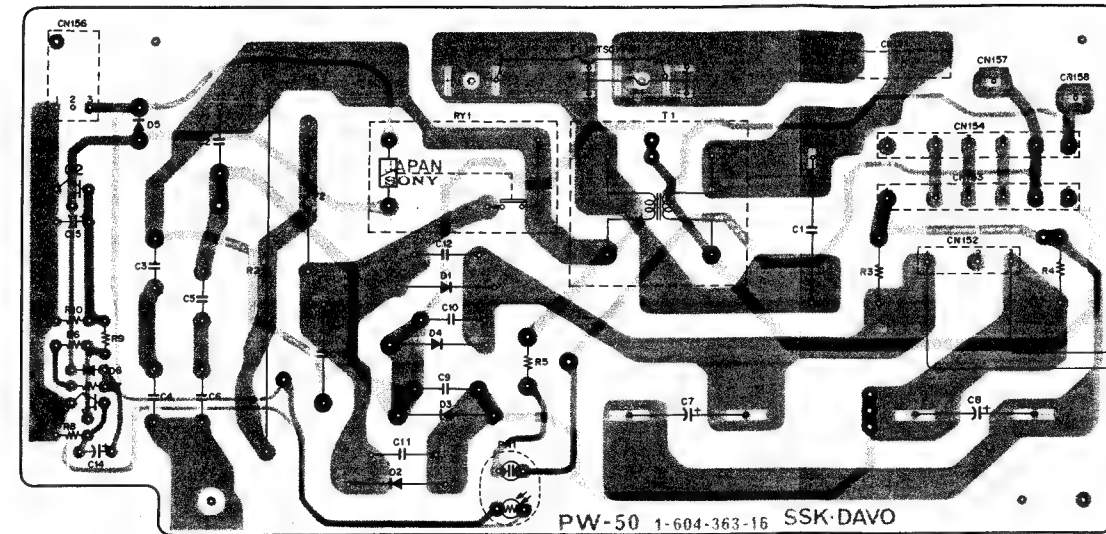


**FU-16 - COMPONENT SIDE -**  
1-605-936-13  
BVU-820PIS/N.10601~112301  
BVU-820SIS/N.10051~100601

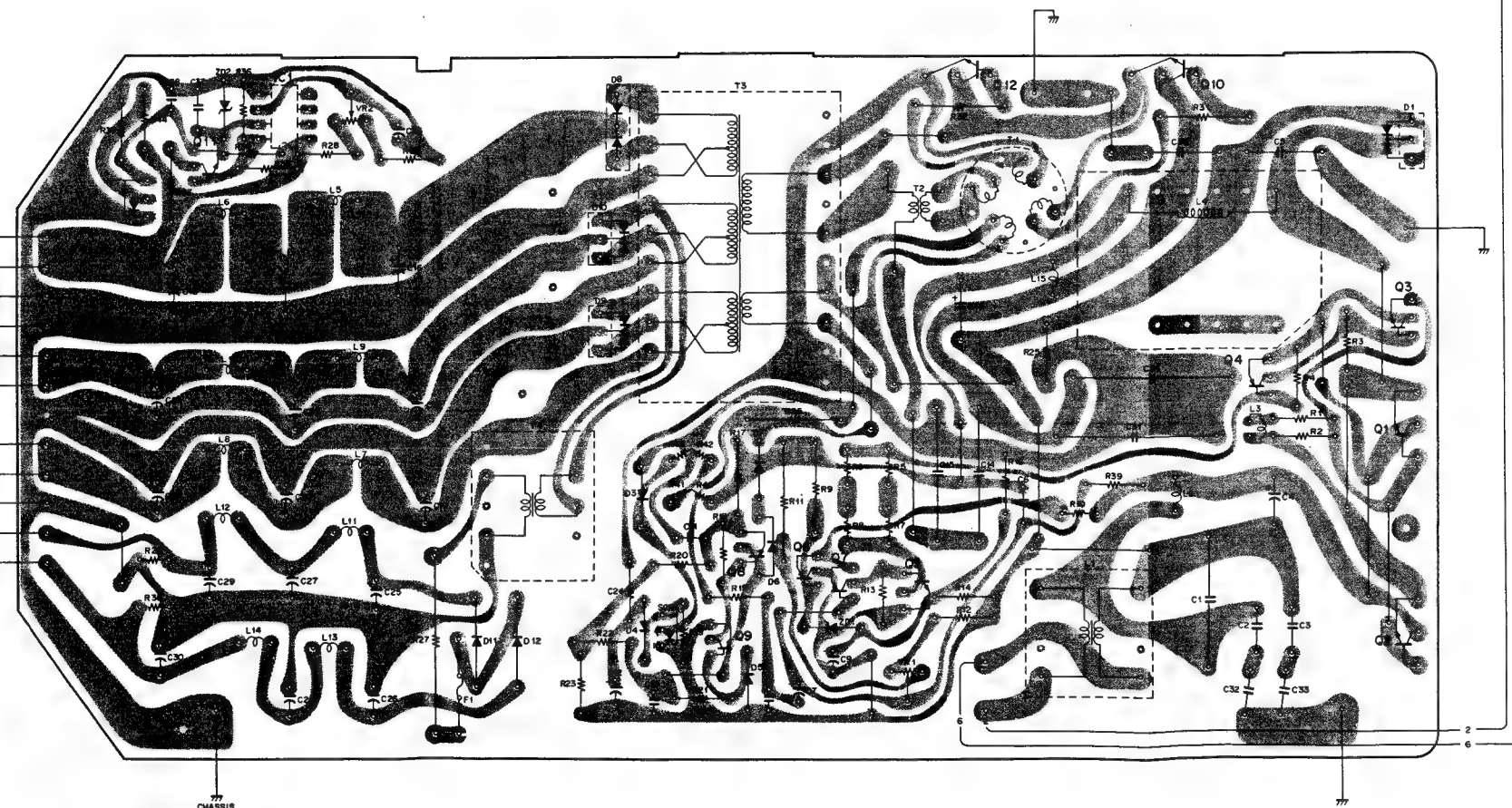


**FU-13 - COMPONENT SIDE -**  
1-604-556-14  
BVU-820 (S/N.10746~11375(U/C))  
(S/N.10251~10440(J))  
BVU-820PM (S/N.10006~10010)

17-81(a)



**PW-50 - SOLDERING SIDE -**  
1-604-363-15,16



**PW-79 - SOLDERING SIDE -**  
1-604-555-14

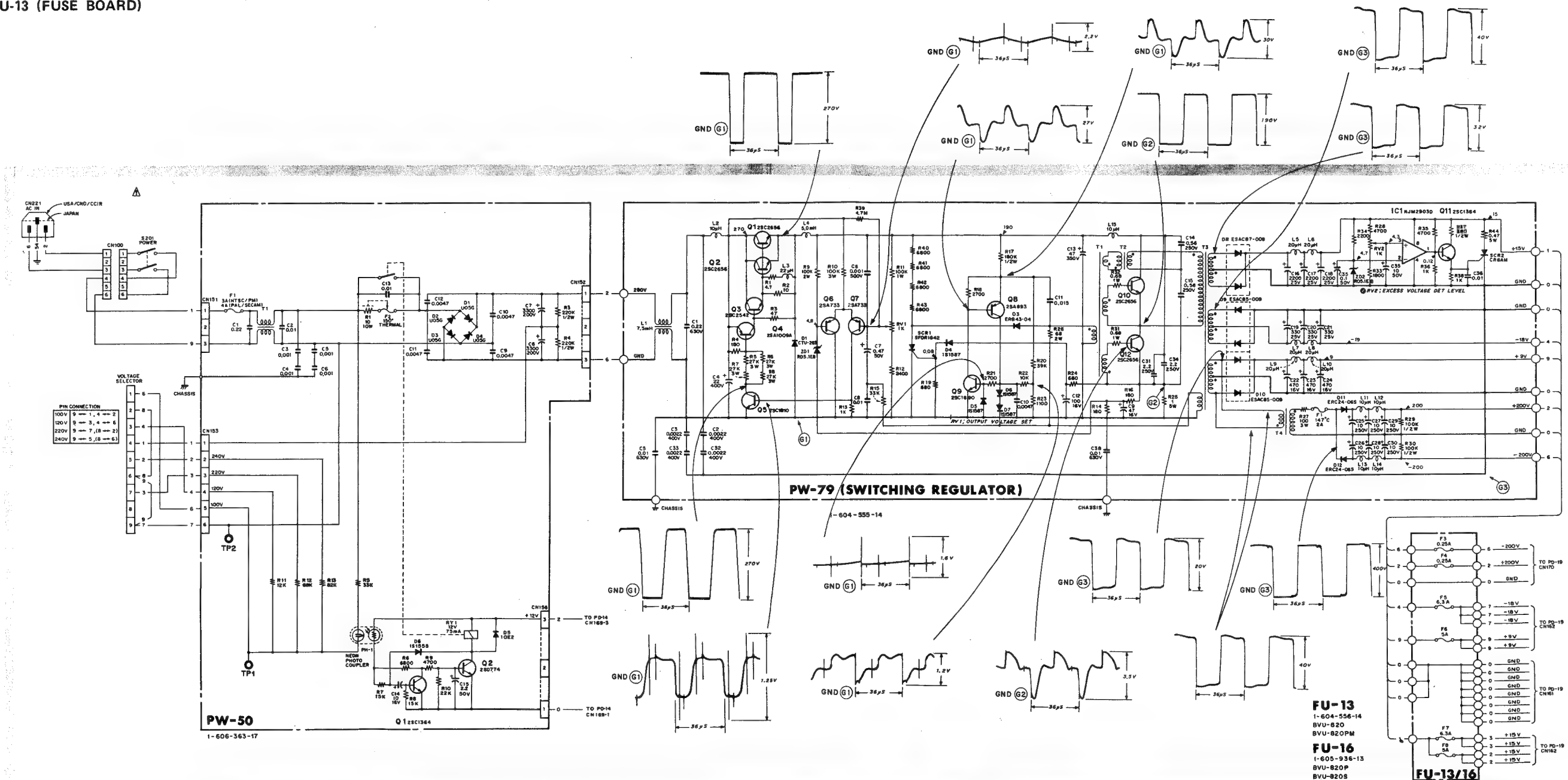
17-82(a)

PW-50, PW-79, FU-13

PW-50, PW-79, FU-13

PW-50 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-13 (FUSE BOARD)

SER. NO. 11376 and higher (U/C)  
SER. NO. 10441 and higher (J)



BVU-820 (S/N.11376~(U/C))  
BVU-820P (S/N.10441~(J))  
BVU-820S (S/N.1231~)  
BVU-820S (S/N.10061~)  
BVU-820PM (S/N.10011~)

**NOTE:**

The shaded and  $\Delta$ -marked components are critical to safety.  
Replace only with same components as specified.

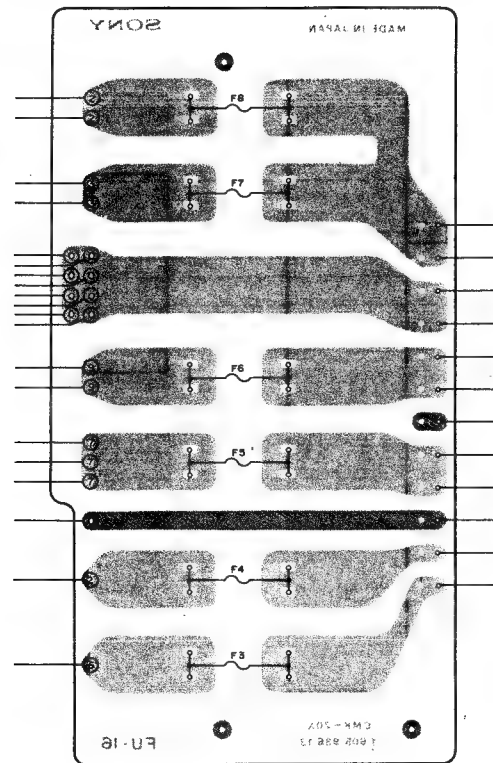


PW-50, PW-79, FU-13

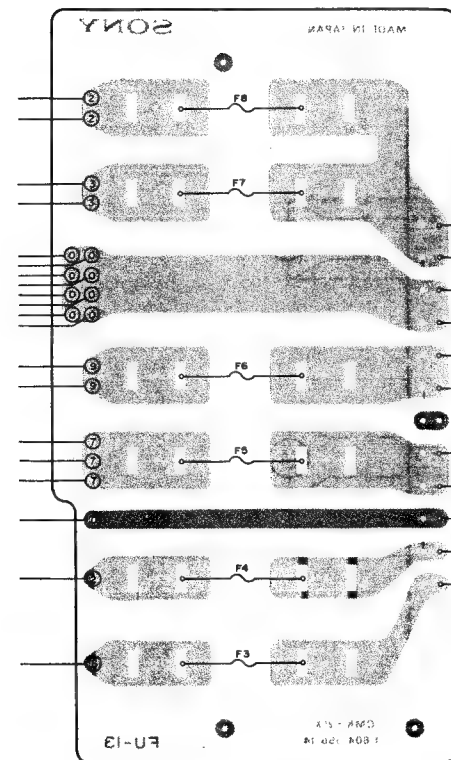
PW-50, PW-79, FU-13

PW-50 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-13 (FUSE BOARD)

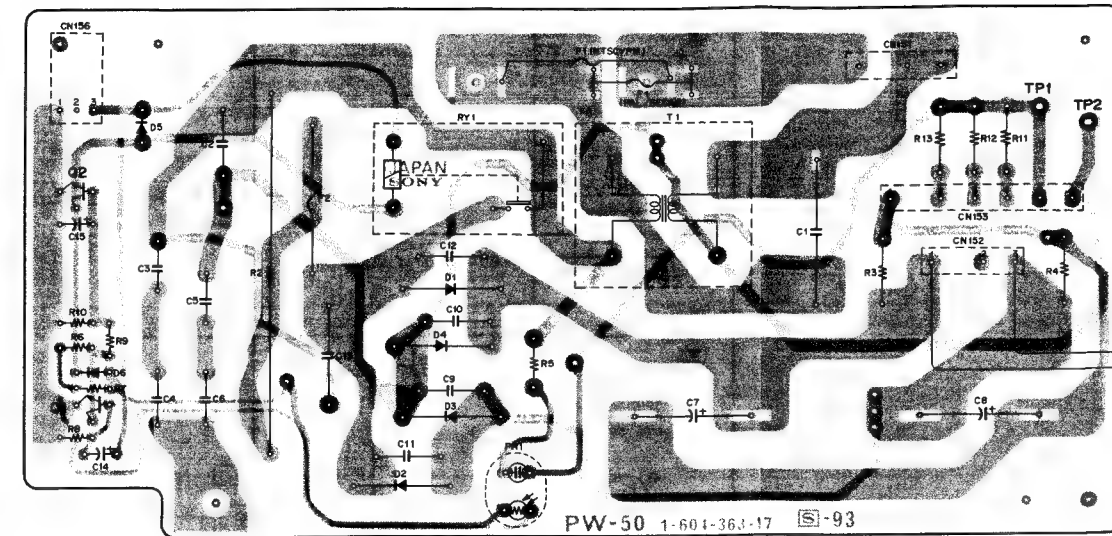
SER. NO. 11376 and higher (U/C)  
SER. NO. 10441 and higher (J)



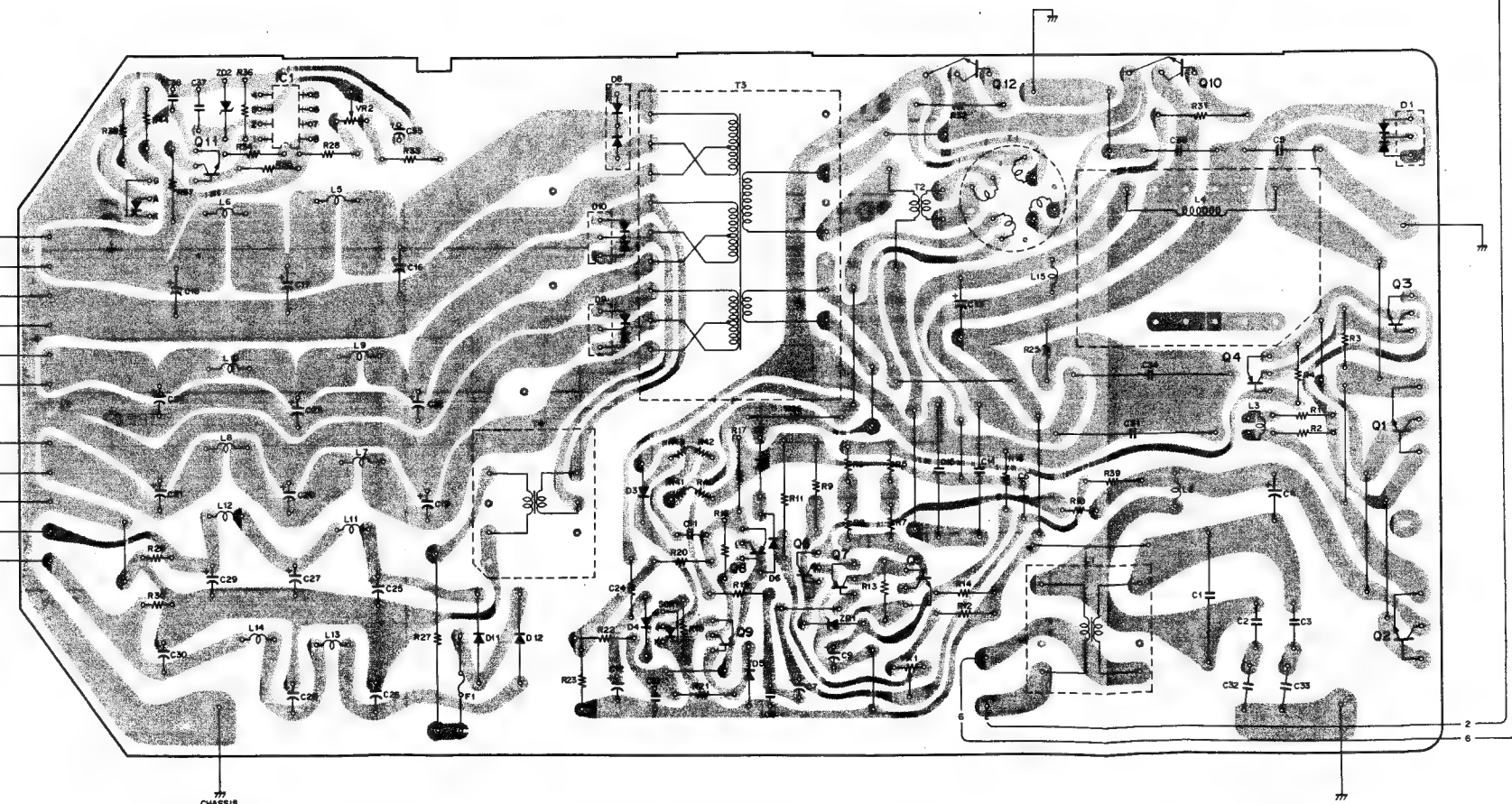
**FU-16 - COMPONENT SIDE -**  
1-605-936-13  
BVU-820P(S/N.11231 ~)  
BVU-820S(S/N.10061 ~)



**FU-13 - COMPONENT SIDE -**  
1-604-556-14  
BVU-820 (S/N.11376 ~ (U/C))  
(S/N.10441 ~ (J))  
BVU-820PM (S/N.10011 ~)



**PW-50 - SOLDERING SIDE -**  
1-604-363-17



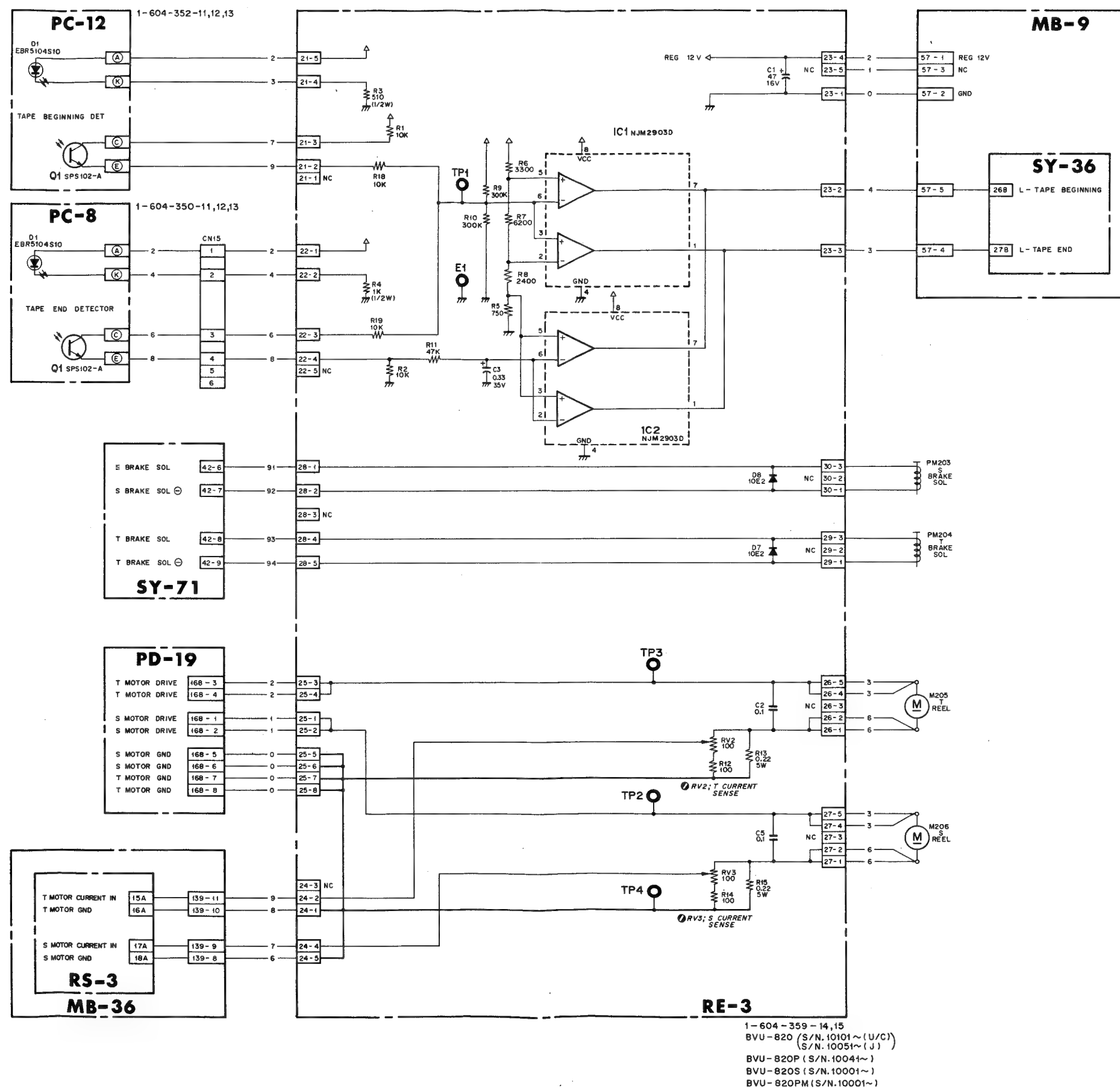
**PW-79 - SOLDERING SIDE -**  
1-604-555-14

RE-3, PC-8, PC-12

RE-3, PC-8, PC-12

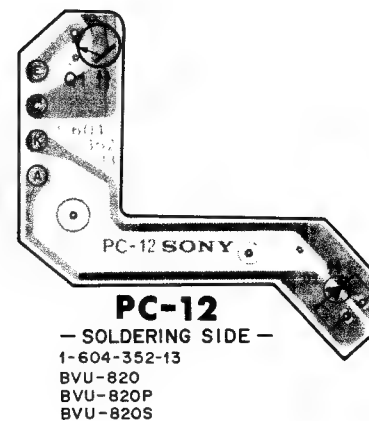
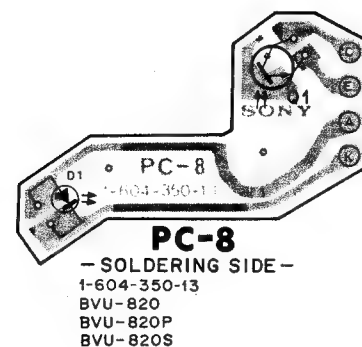
RE-3 (REEL MOTOR)  
PC-8, PC-12 (TAPE POSITION DETECTOR)

Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)

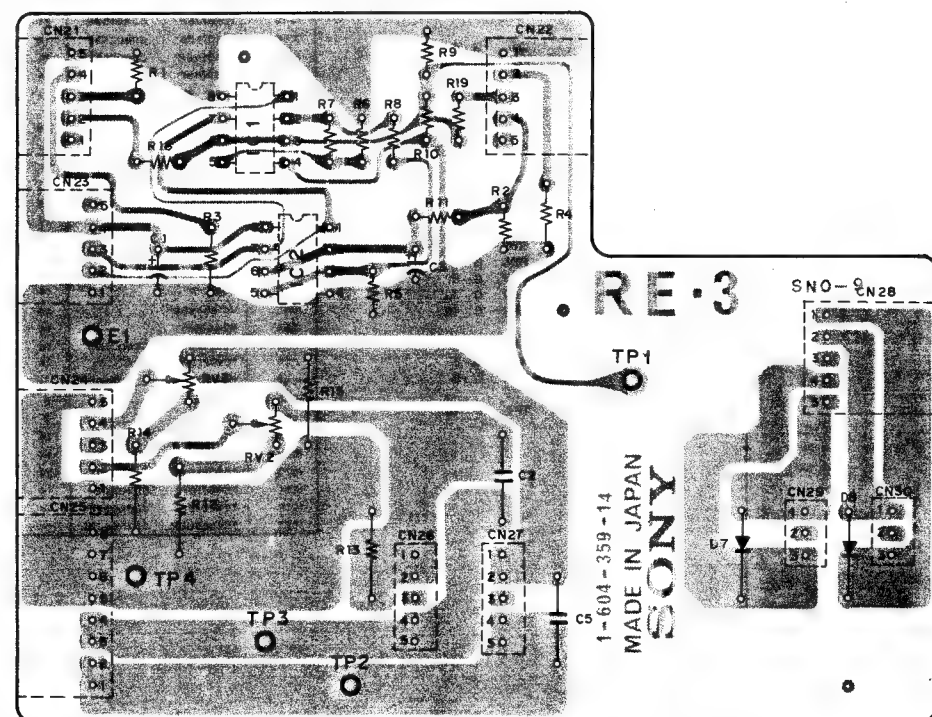


RE-3 (REEL MOTOR)  
PC-8, PC-12 (TAPE POSITION DETECTOR)

Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)

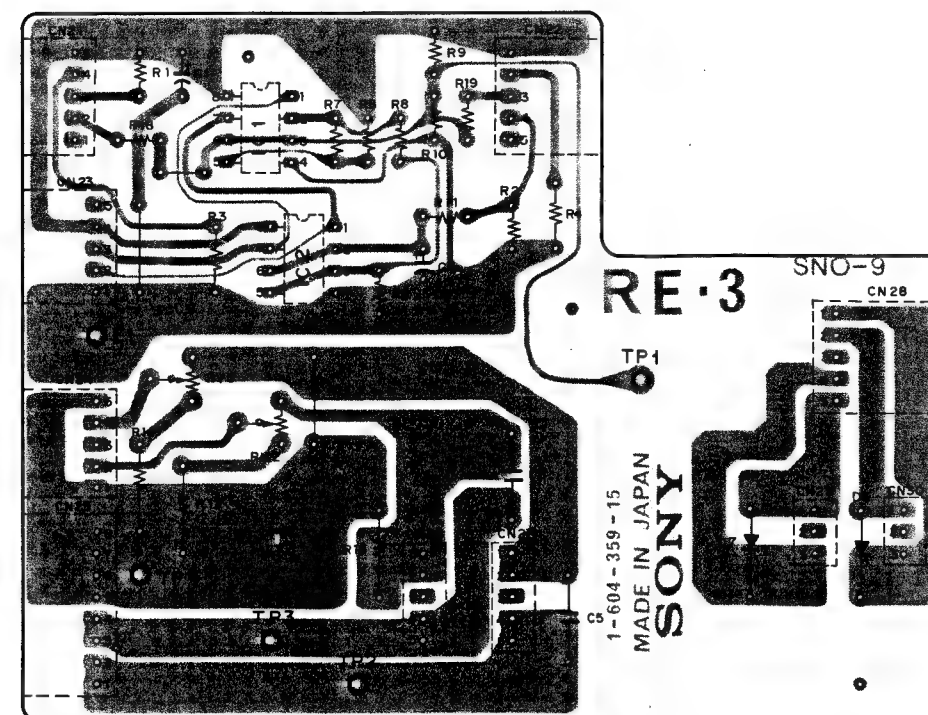


Serial No. 10051 to 10200 (J)  
Serial No. 10101 to 10350 (U/C)



RE-3—SOLDERING SIDE —  
1-604-359-14  
BVU-820 (S/N.10101~10350 (U/C))  
(S/N.10051~10200 (J))  
BVU-820P (S/N.10041~10220)  
BVU-820S (S/N.10001~10020)

Serial No. 10201 and higher (J)  
Serial No. 10351 and higher (U/C)

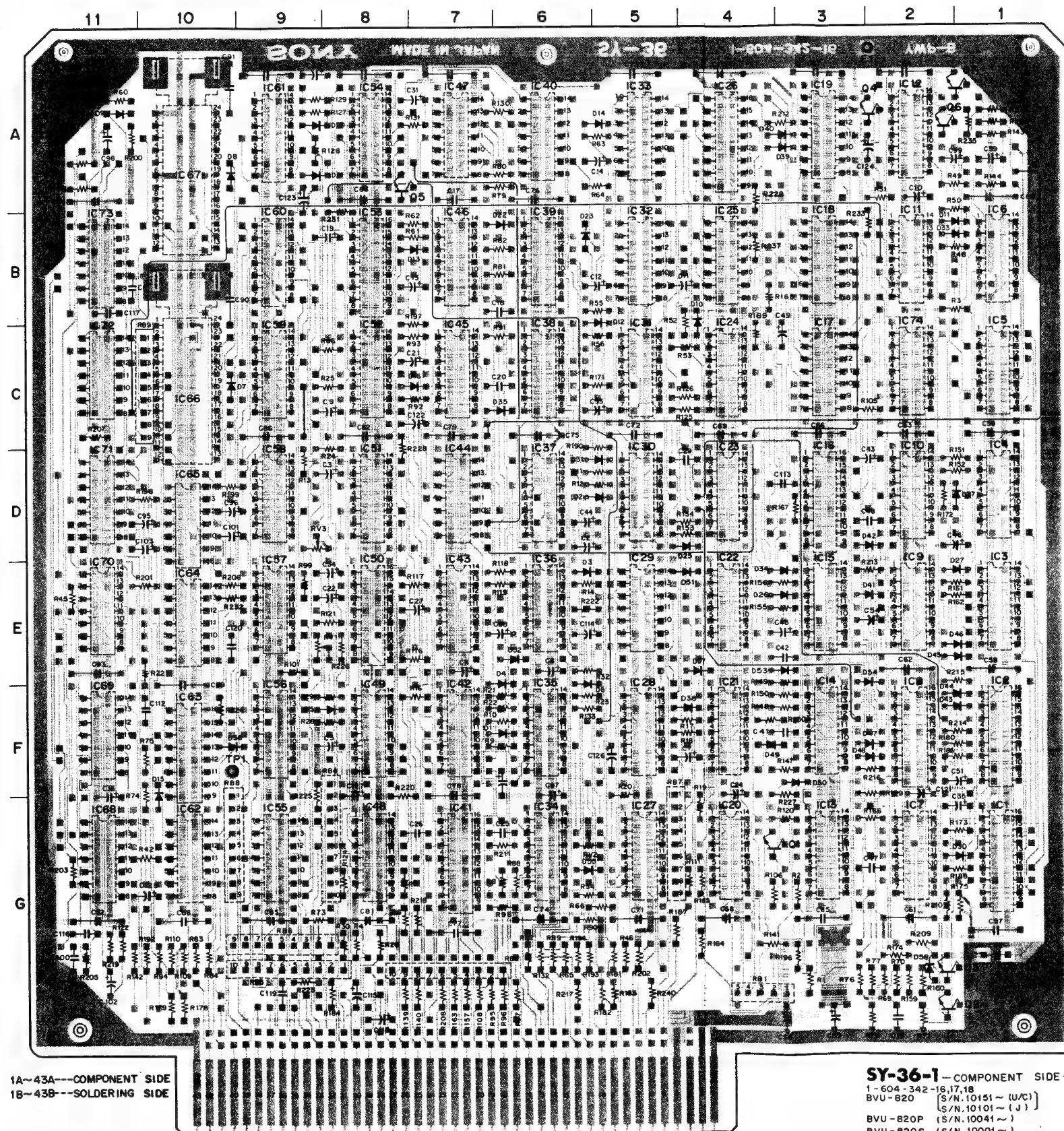


RE-3—SOLDERING SIDE —  
1-604-359-15  
BVU-820 (S/N.10351~ (U/C))  
(S/N.10201~ (J))  
BVU-820P (S/N.10221~)  
BVU-820S (S/N.10021~)  
BVU-820PM (S/N.10001~)



## SY-36-1 (FUNCTION SYSTEM CONTROL)

Serial No. 10101 and higher (J)  
Serial No. 10151 and higher (U/C)



1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

SY-36-1---COMPONENT SIDE---  
1-604-342-16,17,18  
BVU-820 (S/N.10151~(U/C))  
BVU-820P (S/N.10101~(J))  
BVU-820S (S/N.10001~)  
BVU-820PM (S/N.10001~)

D1	F-6	IC24	C-4
D2	D-5	IC25	B-4
D3	E-6	IC26	A-4
D4	F-6	IC27	G-5
D5	F-8	IC28	F-5
D6	E-6	IC29	E-5
D7	C-10	IC30	D-5
D8	A-10	IC31	C-5
D9	A-11	IC32	B-5
D10	C-4	IC33	A-5
D11	B-2	IC34	G-6
D12	C-5	IC35	F-6
D13	B-7	IC36	E-6
D14	A-5	IC37	D-6
D15	F-10	IC38	C-6
D16	C-7	IC39	B-6
D20	A-9	IC40	A-6
D21	A-9	IC41	G-7
D22	B-6	IC42	F-7
D23	B-6	IC43	E-7
D25	D-4	IC44	D-7
D26	E-3	IC45	C-7
D27	E-2	IC46	B-7
D30	G-2	IC47	A-7
D31	D-5	IC48	G-8
D33	B-2	IC49	F-8
D34	D-3	IC50	E-8
D35	C-6	IC51	D-8
D37	D-1	IC52	C-8
D38	F-4	IC53	B-8
D39	A-3	IC54	A-8
D40	A-3	IC55	G-9
D41	E-2	IC56	F-9
D42	D-2	IC57	E-9
D43	F-2	IC58	D-9
D44	F-2	IC59	C-9
D45	E-2	IC60	B-9
D46	E-2	IC61	A-9
D47	E-2	IC62	G-10
D49	F-4	IC63	F-10
D50	F-3	IC64	E-10
D51	E-4	IC65	D-10
D52	E-6	IC66	C-10
D53	E-3	IC67	A-10
D54	F-2	IC68	G-11
D55	G-6	IC69	F-11
D56	E-4	IC70	E-11
D57	E-4	IC71	D-11
D58	G-2	IC72	C-11
		IC73	B-11
E1	A-2	IC74	C-2
IC1	G-1		
IC2	F-1	Q1	G-4
IC3	E-1	Q2	G-2
IC4	D-1	Q3	G-2
IC5	C-1	Q4	A-2
IC6	B-1	Q5	A-7
IC7	G-2	Q6	A-2
IC8	F-2	Q7	A-1
IC9	E-2		
IC10	D-2	RB1	G-4
IC11	B-2	RB2	G-7
IC12	A-2	RB3	G-9
IC13	G-3	RB4	G-8
IC14	F-3	RB5	G-7
IC15	E-3	RB6	G-9
IC16	D-3	RB7	G-5
IC17	C-3	RB8	G-10
IC18	B-3	RB9	C-10
IC19	A-3		
IC20	G-4	RV1	E-9
IC21	F-4	RV2	G-6
IC22	E-4	RV3	D-9
IC23	D-4		
		TP1	F-10

REF. NO.	TYPE	PIN NO.	
		+V (5V)	GND
IC1	TC40161BP, CD40161BE	16	8
IC2	TC4512BP, MC14512BCP	16	8
IC3	TC4081BP, CD4081BE	14	7
IC4	TC4011BP, CD4011BE	14	7
IC5	TC4073BP, CD4073BE	14	7
IC6	TC4075BP, CD4075BE	14	7
IC7	TC4081BP, CD4081BE	14	7
IC8	TC4512BP, MC14512BCP	16	8
IC9	TC4081BP, CD4081BE	14	7
IC10	TC4069UBP, CD4069UBE	14	7
IC11	TC4069UBP, CD4069UBE	14	7
IC12	TC4082BP, CD4082BE	14	7
IC13	TC4069UBP, CD4069UBE	14	7
IC14	TC4071BP, CD4071BE	14	7
IC15	TC4001BP, CD4001BE	14	7
IC16	TC4043BP, CD4043BE	16	8
IC17	TC4071BP, CD4071BE	14	7
IC18	TC4071BP, CD4071BE	14	7
IC19	TC4073BP, CD4073BE	14	7
IC20	M54529P	14	7
IC21	TC4025BP, CD4025BE	14	7
IC22	TC4075BP, CD4075BE	14	7
IC23	TC4001BP, CD4001BE	14	7
IC24	TC4069UBP, CD4069UBE	14	7
IC25	TC4025BP, CD4025BE	14	7
IC26	TC4043BP, CD4043BE	16	8
IC27	M54529P	14	7
IC28	TC4069UBP, CD4069UBE	14	7
IC29	TC4023BP, CD4023BE	14	7
IC30	MC14584BCP	14	7
IC31	TC4081BP, CD4081BE	14	7
IC32	TC4011BP, CD4011BE	14	7
IC33	TC4001BP, CD4001BE	14	7
IC34	TC4069UBP, CD4069UBE	14	7
IC35	TC4075BP, CD4075BE	14	7
IC36	TC4071BP, CD4071BE	14	7
IC37	TC4012BP, CD4012BE	14	7
IC38	TC4071BP, CD4071BE	14	7
IC39	TC4072BP, CD4072BE	14	7
IC40	TC4073BP, CD4073BE	14	7
IC41	TC4528BP, MC14528BCP	16	8
IC42	TC4081BP, CD4081BE	14	7
IC43	TC4011BP, CD4011BE	14	7
IC44	M54529P	14	7
IC45	TC4073BP, CD4073BE	14	7
IC46	TC4071BP, CD4071BE	14	7
IC47	TC4001BP, CD4001BE	14	7
IC48	TC4001BP, CD4001BE	14	7
IC49	TC4011BP, CD4011BE	14	7
IC50	HD14338BP	16	8
IC51	TC4068BP, CD4068BE	14	7
IC52	TC4023BP, CD4023BE	14	7
IC53	TC4043BP, CD4043BE	16	8
IC54	TC4069UBP, CD4069UBE	14	7
IC55	TC4069UBP, CD4069UBE	14	7
IC56	M54529P	14	7
IC57	TC4093BP, CD4093BE	14	7
IC58	TC4073BP, CD4073BE	14	7
IC59	TC4001BP, CD4001BE	14	7
IC60	M54529P	14	7
IC61	MC14584BCP	14	7
IC62	M54529P	14	7
IC63	TC4027BP, CD4027BE	16	8
IC64	TC4071BP, CD4071BE	14	7
IC65	TC4082BP, CD4082BE	14	7
IC66	CX756A	F	24
IC67	CX757	F	1
IC68	TC4001BP, CD4001BE	14	7
IC69	TC4071BP, CD4071BE	14	7
IC70	TC4081BP, CD4081BE	14	7
IC71	TC4011BP, CD4011BE	14	7
IC72	TC4081BP, CD4081BE	14	7
IC73	TC4069UBP, CD4069UBE	14	7

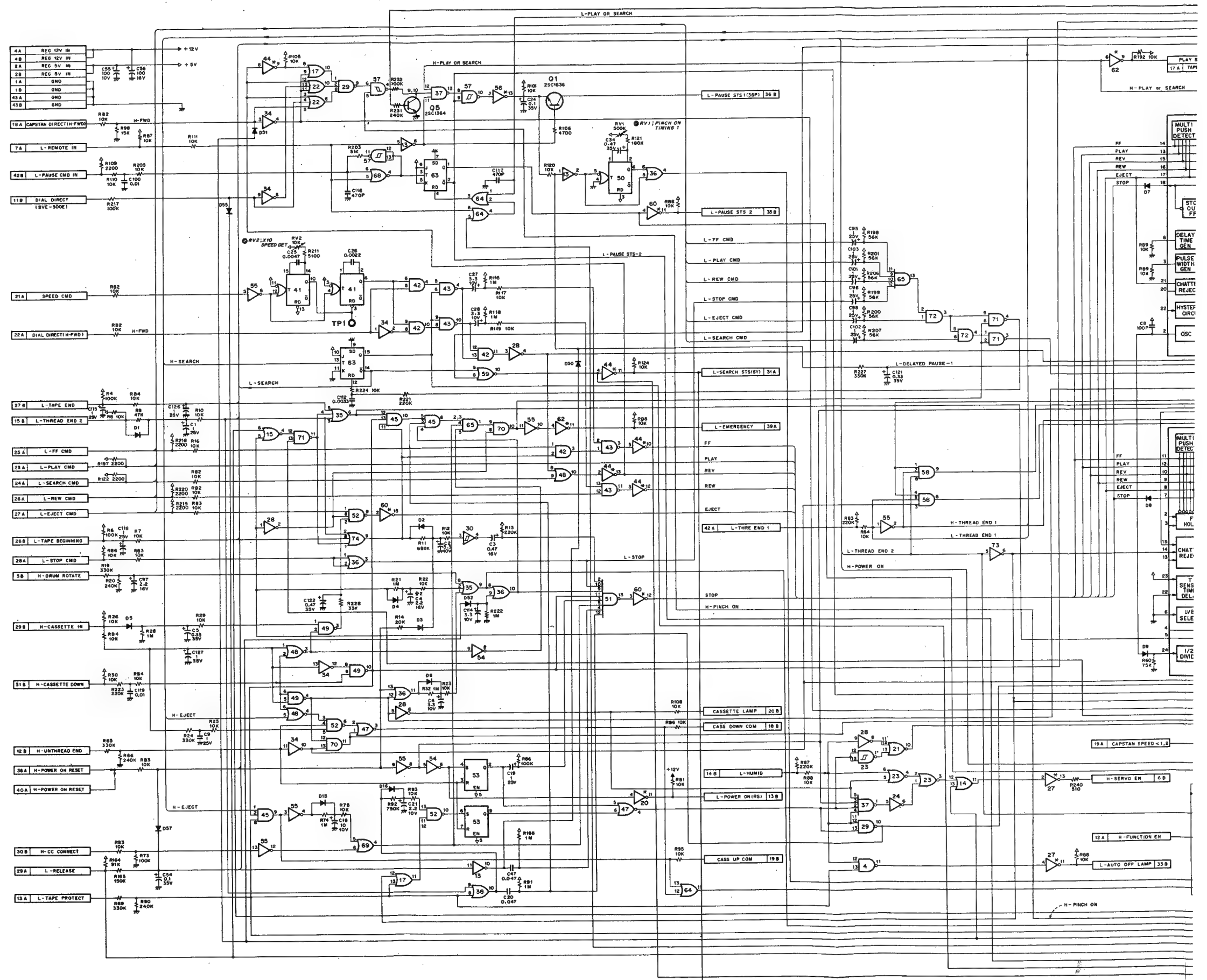


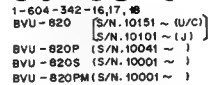
# SY-36-1 (FUNCTION SYSTEM CONTROL)

Serial No. 10101 and higher (J)  
Serial No. 10151 and higher (U/C)

## NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	C38 2.2/25V → 1/100V	J: 10101 ~ P: 10201 ~ S: 10301 ~ PM: 10401 ~
2	C4 1/16V → 2.2/16V	J: 10301 ~ P: 10401 ~ S: 10501 ~ PM: 10601 ~

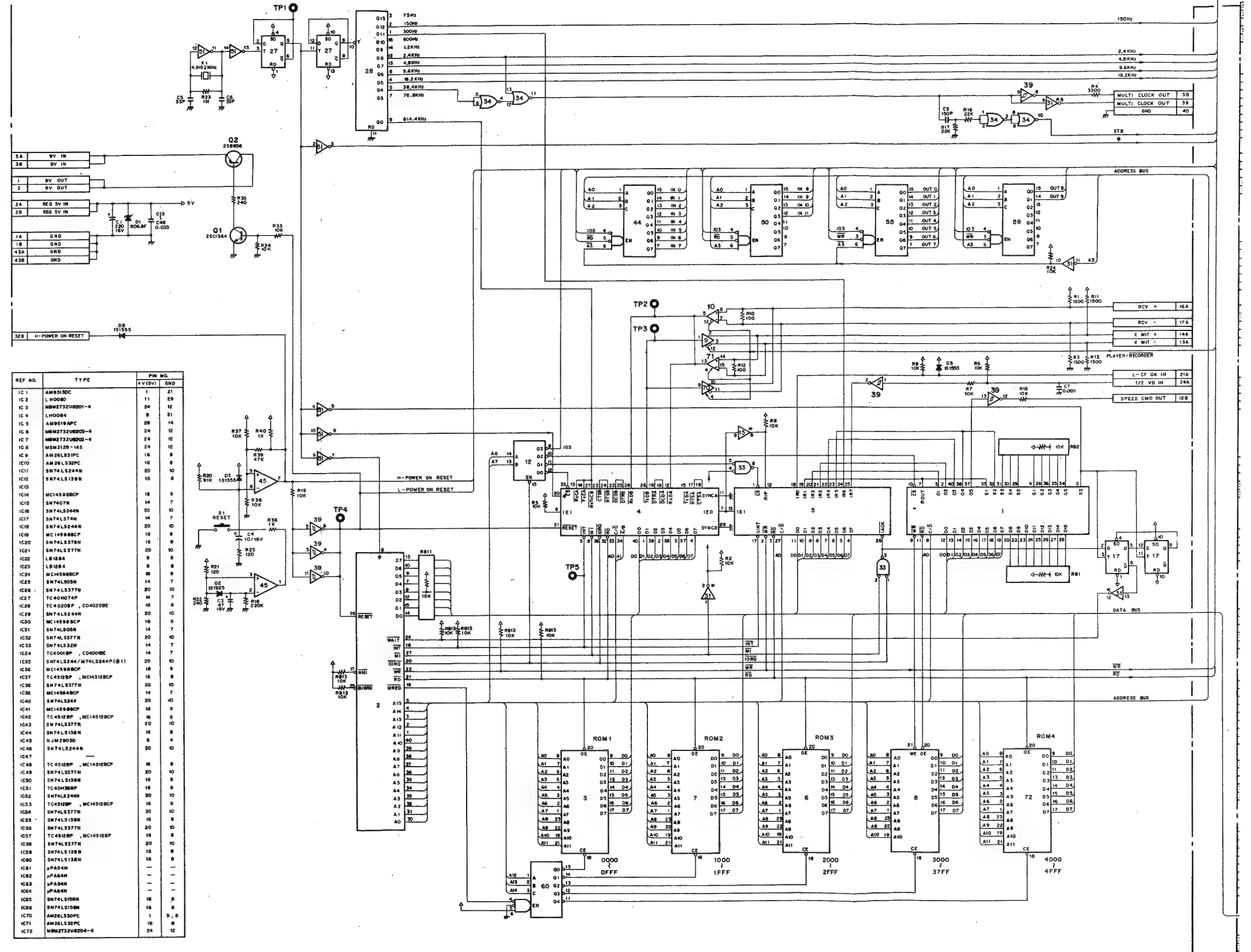


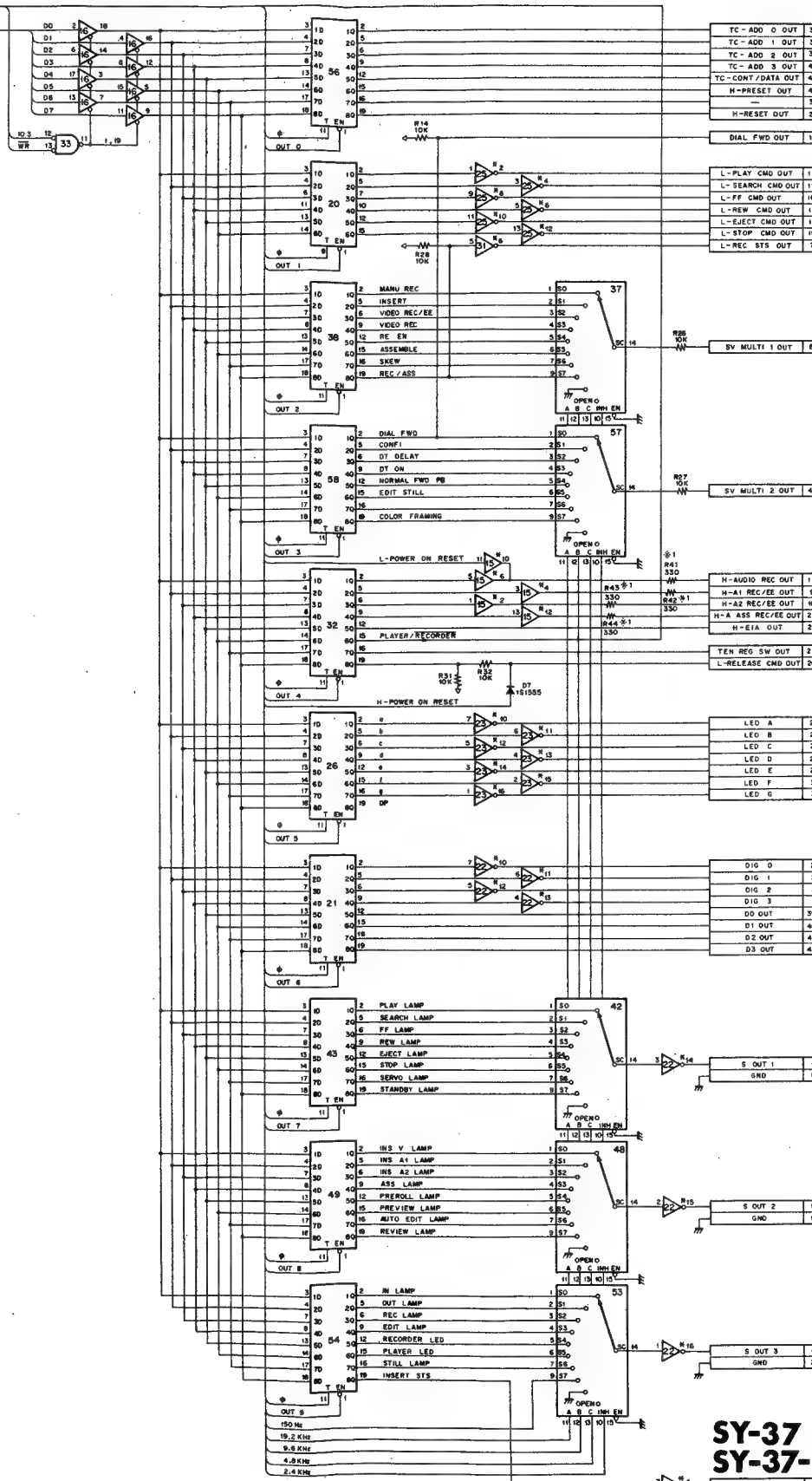
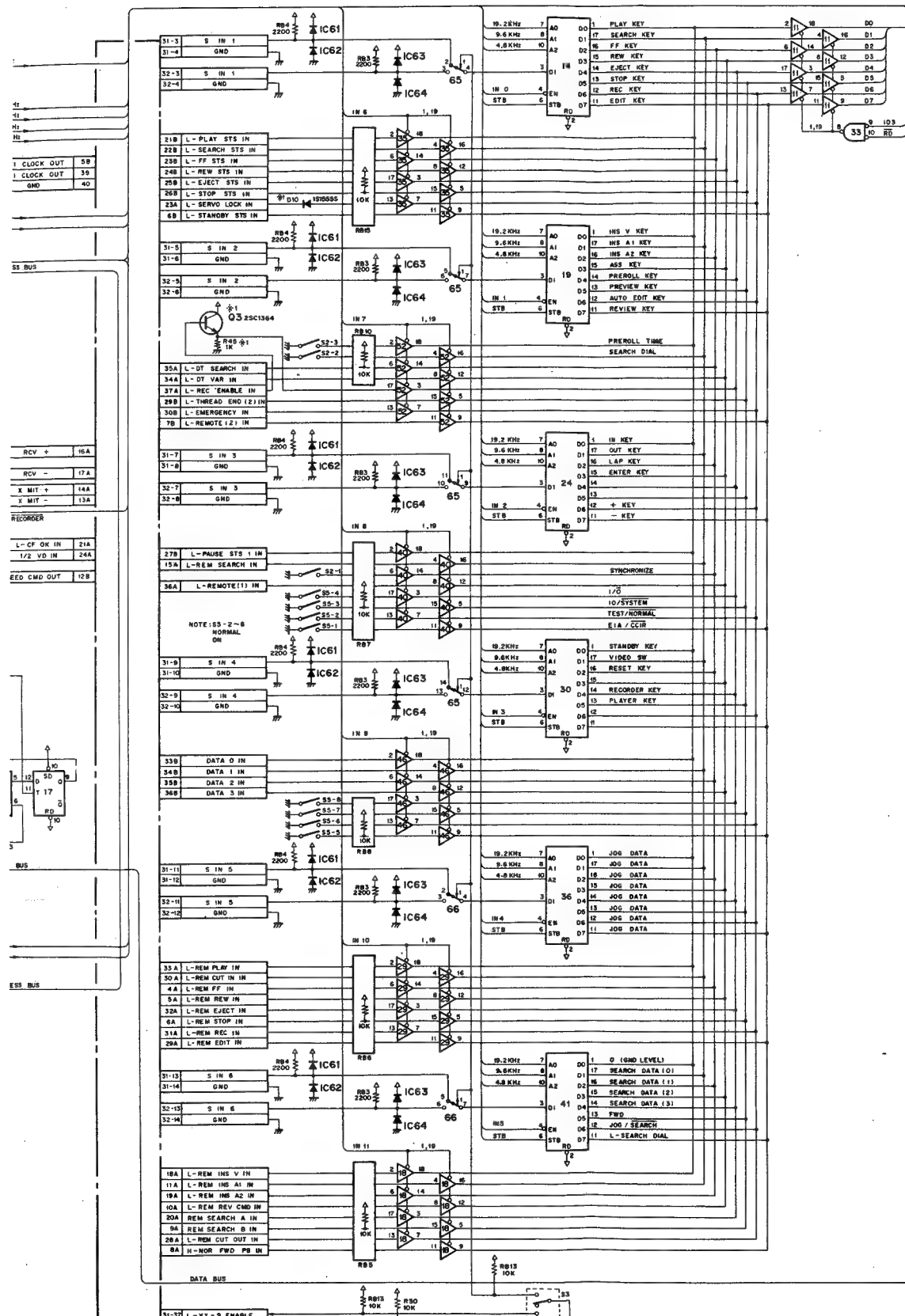


## SY-37 (MICRO PROCESSOR)

MARK	CHANGE INFORMATION	SERIAL NO.
8.1	ADDED - R41, R42, R43, R44 (330Ω) - Q31 (2SC1364) - R48 (1K)	10001~(U/C) 10001~(J) 10001~(P) 10001~(S) 10001~(PM)
	ADDED: D10 (1S1555)	10021~(U/C) 10021~(J) 10021~(P) 10021~(S) 10021~(PM)
	SHORTED: D10 (NOT IN USE, WHEN MOUNTED) M74LS244P (IC35) CHANGED: IC35 M74LS244-M74LS244P	10031~(U/C) 10031~(J) 10031~(P) 10031~(S) 10031~(PM)
	ROMS VERSION CHANGE (IC3, 6, 7, 12)	10091~(U/C) 10091~(J) 10091~(P) 10091~(S) 10091~(PM)

REF. NO.	TYPE	PIN NO.
IC1	AM9513DC	1 21
IC2	LH0080	11 29
IC3	MM2722UB01-6	24 12
IC4	LH0084	9 31
IC5	AM9519APC	39 14
IC6	MM2722UB02-6	24 12
IC7	MM2722UB02-6	24 12
IC8	MS2120-1A5	24 12
IC9	AM26LS31PC	16 8
IC10	AM26LS30PC	16 8
IC11	SN74LS244N	20 10
IC12	SN74LS138N	16 8
IC13	MC14558BCP	18 9
IC14	SN7407N	14 7
IC15	SN74LS244N	20 10
IC16	SN74LS244N	20 10
IC17	SN74LS244N	20 10
IC18	SN74LS244N	20 10
IC19	MC14558BCP	18 9
IC20	SN74LS377N	20 10
IC21	SN74LS377N	20 10
IC22	LS1264	9 8
IC23	LS1264	9 8
IC24	MC14558BCP	18 9
IC25	SN74LS377N	20 10
IC26	SN74LS377N	20 10
IC27	TC40074P	14 7
IC28	TC40074P, CD4007BE	14 7
IC29	SN74LS244N	20 10
IC30	MC14558BCP	18 9
IC31	SN74LS377N	20 10
IC32	SN74LS377N	20 10
IC33	SN74LS377N	20 10
IC34	TC40074P, CD4007BE	14 7
IC35	SN74LS244/M74LS244P (8.1)	20 10
IC36	MC14558BCP, MC14512BCP	18 9
IC37	TC40074P, MC14512BCP	14 7
IC38	SN74LS377N	20 10
IC39	MC14558BCP	18 9
IC40	SN74LS244	20 10
IC41	MC14558BCP	18 9
IC42	TC40074P, MC14512BCP	14 7
IC43	SN74LS377N	20 10
IC44	SN74LS138N	16 8
IC45	HJM2903D	8 4
IC46	SN74LS244N	20 10
IC47	TC40074P, MC14512BCP	14 7
IC48	SN74LS377N	20 10
IC49	SN74LS138N	16 8
IC50	TC40074P	14 7
IC51	TC40074P	14 7
IC52	SN74LS244N	20 10
IC53	TC40074P, MC14512BCP	14 7
IC54	SN74LS377N	20 10
IC55	SN74LS138N	16 8
IC56	SN74LS377N	20 10
IC57	TC40074P, MC14512BCP	14 7
IC58	SN74LS377N	20 10
IC59	SN74LS138N	16 8
IC60	SN74LS138N	16 8
IC61	μP454N	—
IC62	μP454N	—
IC63	μP454N	—
IC64	μP454N	—
IC65	SN74LS138N	16 8
IC66	SN74LS138N	16 8
IC67	AM26LS30PC	16 8
IC68	AM26LS31PC	16 8
IC69	MM2722UB02-6	24 12



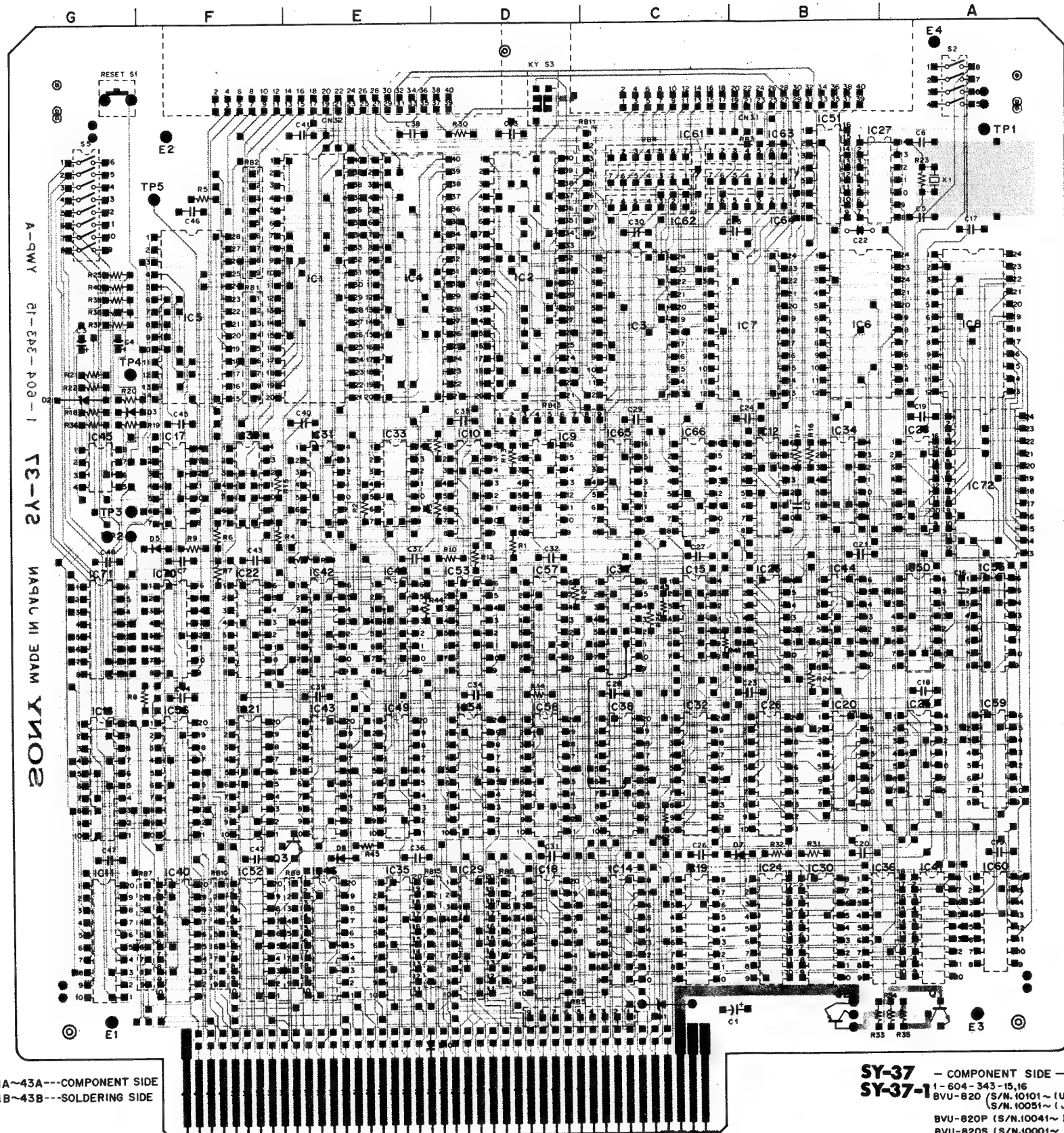


1-604-343-13,14,15,16  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM



SY-37 (MICRO PROCESSOR)

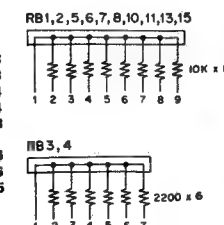
Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)



CN31 B-1  
CN32 E-1  
D1 C-6  
D2 G-2  
D3 G-2  
D5 F-3  
D6 D-6  
D7 B-6  
D8 E-6  
D10 E-6  
R1 F-2  
R2 F-1  
R3 B-1  
R4 C-1  
R5 D-6  
R6 D-6  
R7 F-6  
R8 E-6  
R10 F-6  
R11 C-1  
R13 D-3  
R15 E-6

E1 G-6  
E2 F-1  
E3 A-6  
E4 A-1  
S1 G-1  
S2 A-1  
S3 D-1  
S5 G-1  
TP1 A-1  
TP2 G-3  
TP3 G-3  
TP4 G-2  
TP5 F-1  
X1 A-1

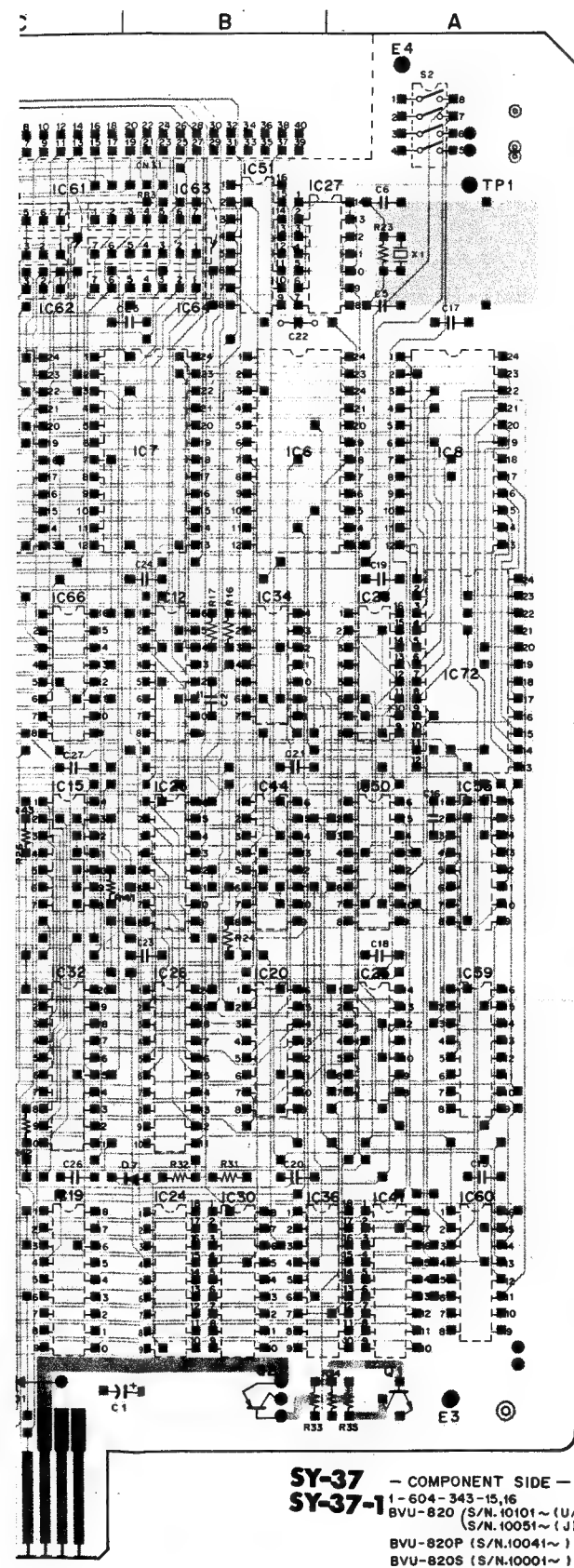
1  
2  
3  
4  
5  
6



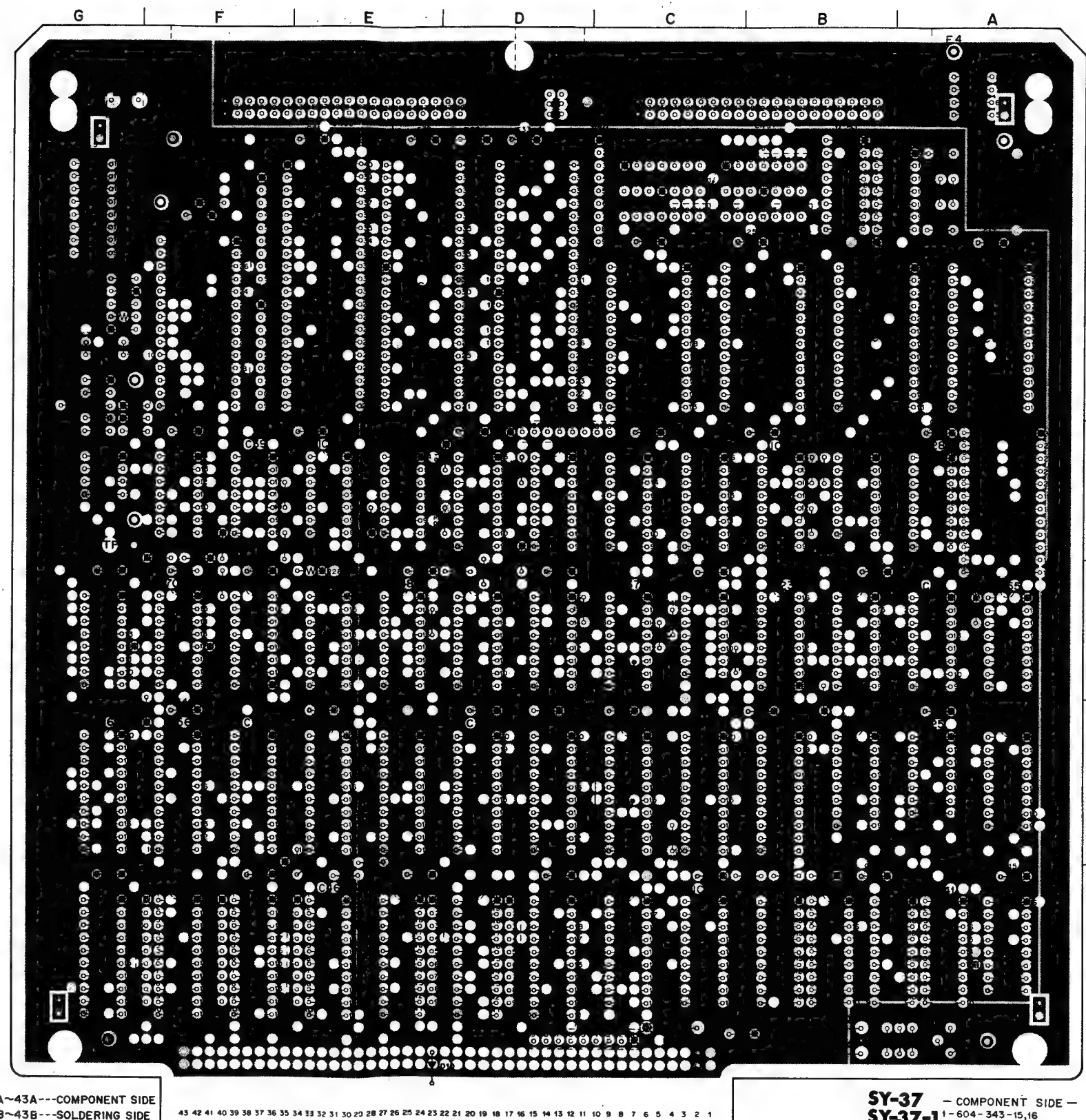
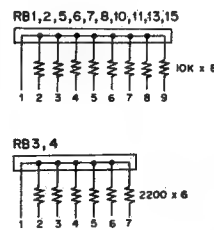
1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27

SY-37 - COMPONENT SIDE -  
SY-37-1 1-604-343-15,16  
BVU-820 (S/N.10101~(U/C))  
(S/N.10051~(J))  
BVU-820P (S/N.10041~)  
BVU-820S (S/N.10001~)



CN31 B-1	RB1 F-2
CN32 E-1	RB2 F-1
	RB3 B-1
D1 C-6	RB4 C-1
D2 G-2	RB5 D-6
D3 G-2	RB6 D-6
D5 F-3	RB7 F-6
D6 D-6	RB8 E-6
D7 B-6	RB10 F-6
D8 E-6	RB11 C-1
D10 E-6	RB13 D-3
	RB15 E-6
E1 G-6	S1 G-1
E2 F-1	S2 A-1
E3 A-6	S3 D-1
E4 A-1	S5 G-1
IC1 E-2	TP1 A-1
IC2 D-2	TP2 G-3
IC3 C-2	TP3 G-3
IC4 E-2	TP4 G-2
IC5 F-2	TP5 F-1
IC6 B-2	
IC7 B-2	
IC8 A-2	
IC9 D-3	
IC10 D-3	
IC11 G-6	
IC12 B-3	
IC14 C-6	
IC15 C-4	
IC16 G-5	
IC17 F-3	
IC18 D-6	
IC19 C-6	
IC20 B-5	
IC21 F-5	
IC22 F-4	
IC23 B-4	
IC24 B-6	
IC25 A-5	
IC26 B-5	
IC27 B-1	
IC28 A-3	
IC29 D-6	
IC30 B-6	
IC31 E-3	
IC32 C-5	
IC33 E-3	
IC34 B-3	
IC35 E-6	
IC36 B-6	
IC37 C-4	
IC38 C-5	
IC39 F-3	
IC40 F-6	
IC41 A-6	
IC42 E-4	
IC43 E-5	
IC44 B-4	
IC45 G-3	
IC46 E-6	
IC48 E-4	
IC49 E-5	
IC50 A-4	
IC51 B-1	
IC52 F-6	
IC53 D-4	
IC54 D-5	
IC55 A-4	
IC56 F-5	
IC57 D-4	
IC58 D-5	
IC59 A-5	
IC60 A-6	
IC61 C-1	
IC62 C-1	
IC63 B-1	
IC64 B-1	
IC65 C-3	
IC66 C-3	
IC70 F-4	
IC71 G-4	
IC72 A-3	
Q1 A-6	
Q2 B-6	
Q3 E-5	
TP1 A-1	
TP2 G-3	
TP3 G-3	
TP4 G-2	
TP5 F-1	
X1 A-1	

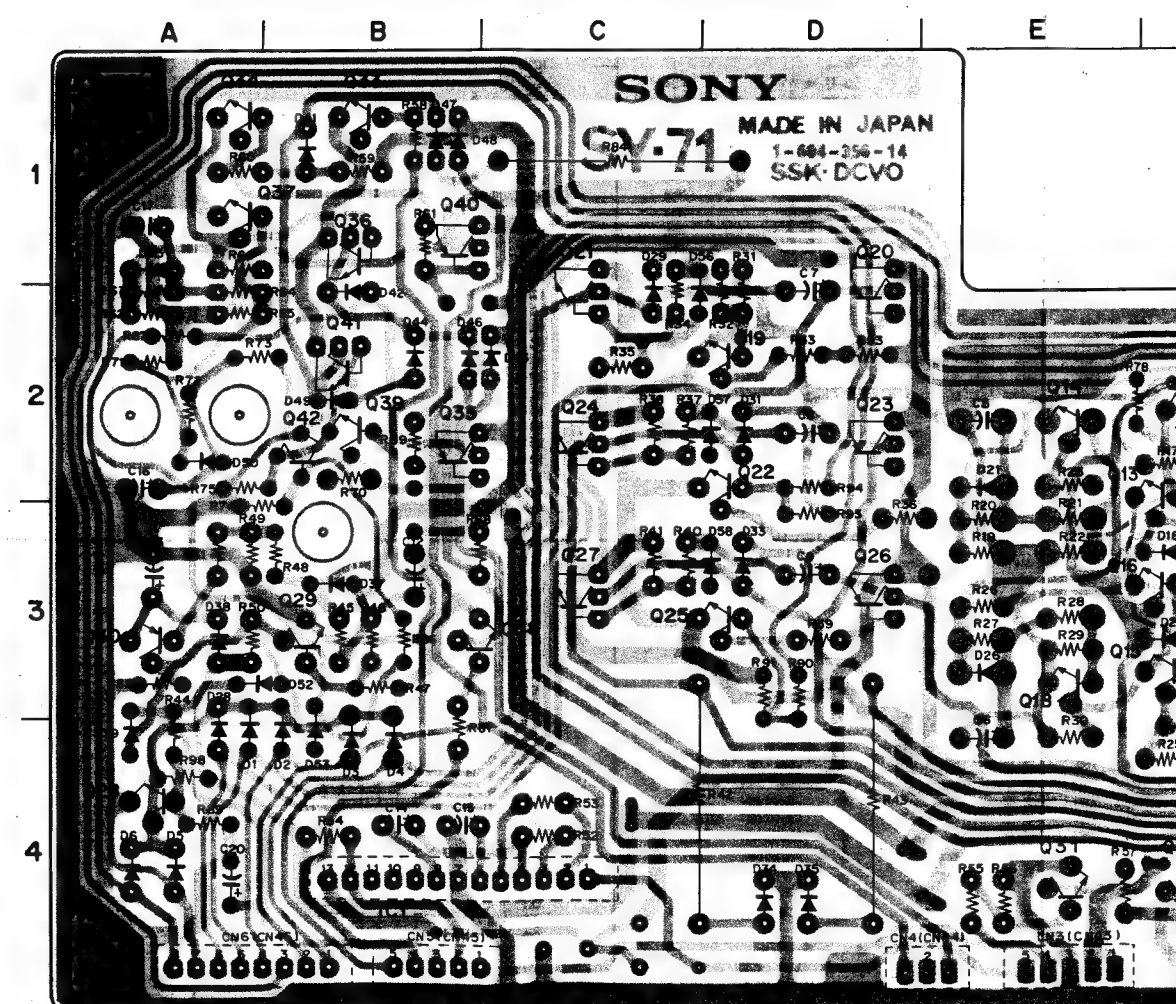




SY-71 (MOTOR/SOLENOID DRIVER)

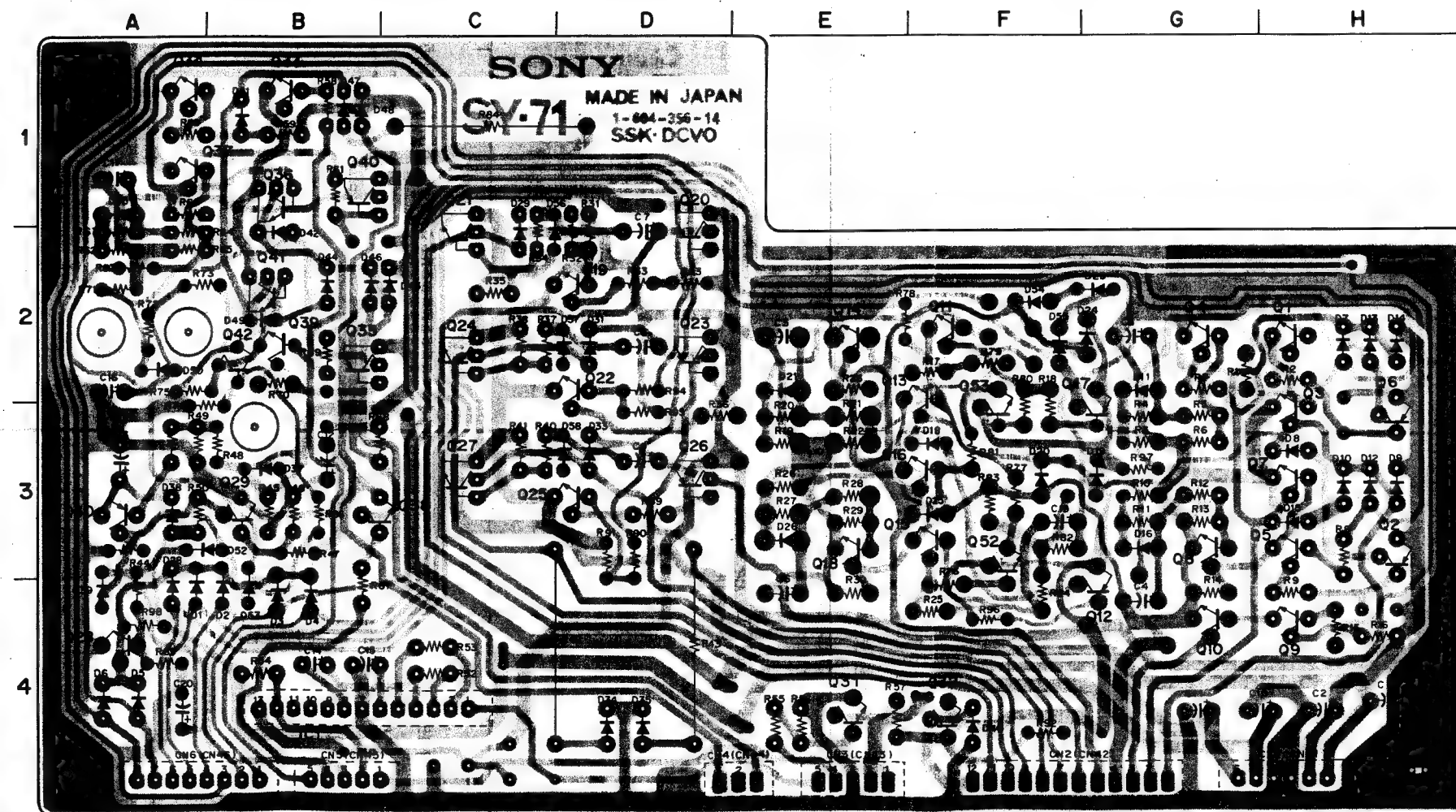
CN1  
CN2  
CN3  
CN4  
CN5  
CN6

D1  
D2  
D3  
D4  
D5  
D6  
D7  
D8  
D9  
D10  
D11  
D12  
D13  
D14  
D15  
D16  
D18  
D19  
D20  
D21  
D22  
D23



SY-71 (MOTOR/SOLENOID DRIVER)

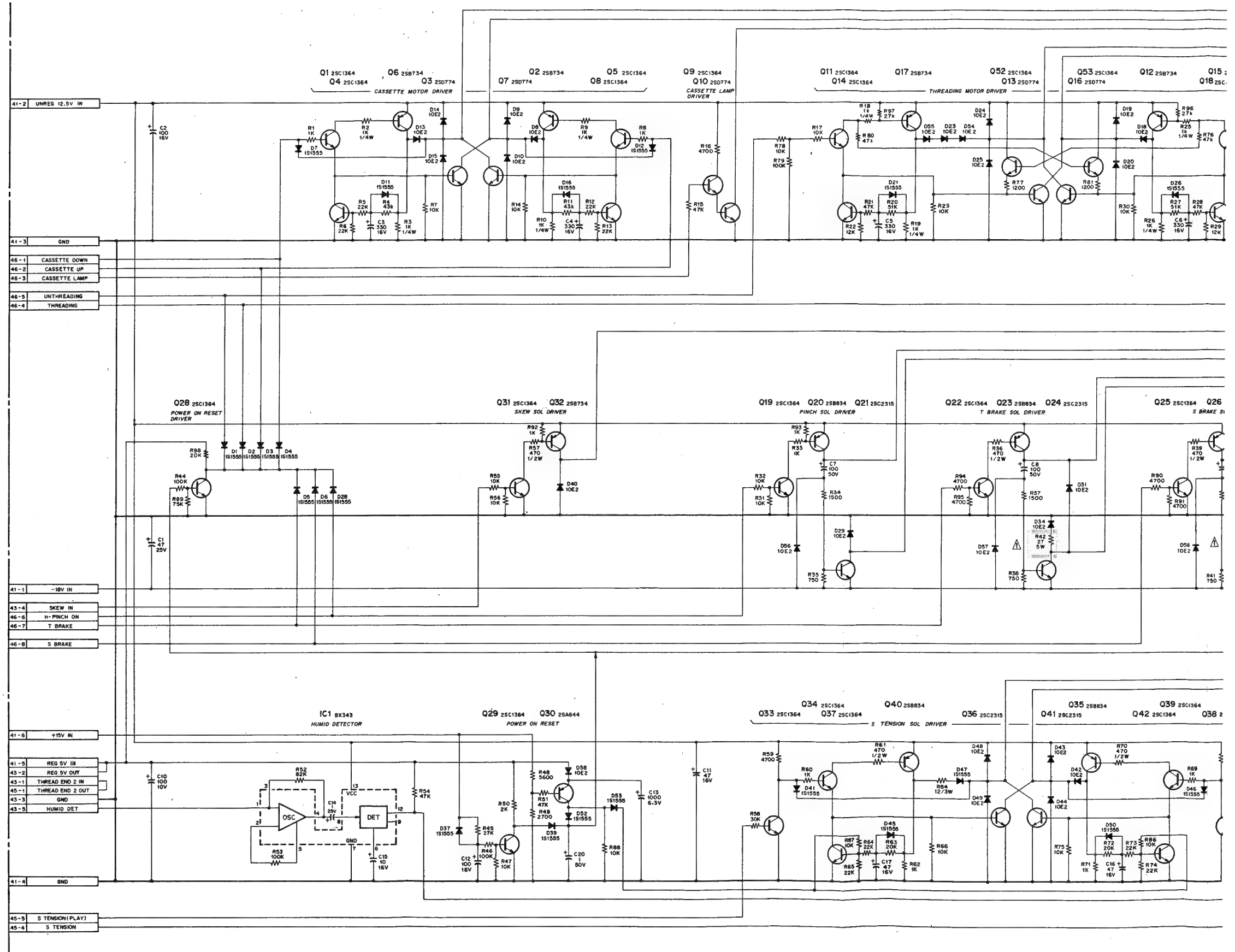
CN1	H-4	D24	G-2	IC1	B-4	Q29	B-3
CN2	F-4	D25	F-3	Q1	H-2	Q30	A-3
CN3	E-4	D26	E-3	Q2	H-3	Q31	E-4
CN4	E-4	D28	A-4	Q3	H-3	Q32	F-4
CN5	B-4	D29	C-2	Q4	G-2	Q33	B-1
CN6	A-4	D31	D-2	Q5	H-3	Q34	A-1
		D33	D-3	Q6	H-3	Q35	B-2
D1	A-4	D34	D-4	Q7	H-3	Q36	B-1
D2	B-4	D35	D-4	Q8	G-3	Q37	A-1
D3	B-4	D37	B-3	Q9	H-4	Q38	B-3
D4	B-4	D38	A-3	Q10	G-4	Q39	B-2
D5	A-4	D39	A-4	Q11	F-2	Q40	B-1
D6	A-4	D40	F-4	Q12	G-4	Q41	B-2
D7	H-2	D41	B-1	Q13	F-2	Q42	B-2
D8	H-3	D42	B-2	Q14	E-2	Q52	F-3
D9	H-3	D43	C-2	Q15	F-3	Q53	F-3
D10	H-3	D44	B-2	Q16	F-3		
D11	G-2	D45	A-1	Q17	G-3		
D12	H-3	D46	B-2	Q18	E-3		
D13	H-2	D47	B-1	Q19	D-2		
D14	H-2	D48	B-1	Q20	D-2		
D15	H-3	D49	B-2	Q21	C-2		
D16	G-3	D50	A-2	Q22	D-2		
D18	F-3	D52	A-3	Q23	D-2		
D19	G-3	D53	B-4	Q24	C-2		
D20	F-3	D54	F-2	Q25	D-3		
D21	E-2	D55	F-2	Q26	D-3		
D22	F-3	D56	D-1	Q27	C-3		
D23	G-2	D57	D-2	Q28	A-4		
		D58	D-3				

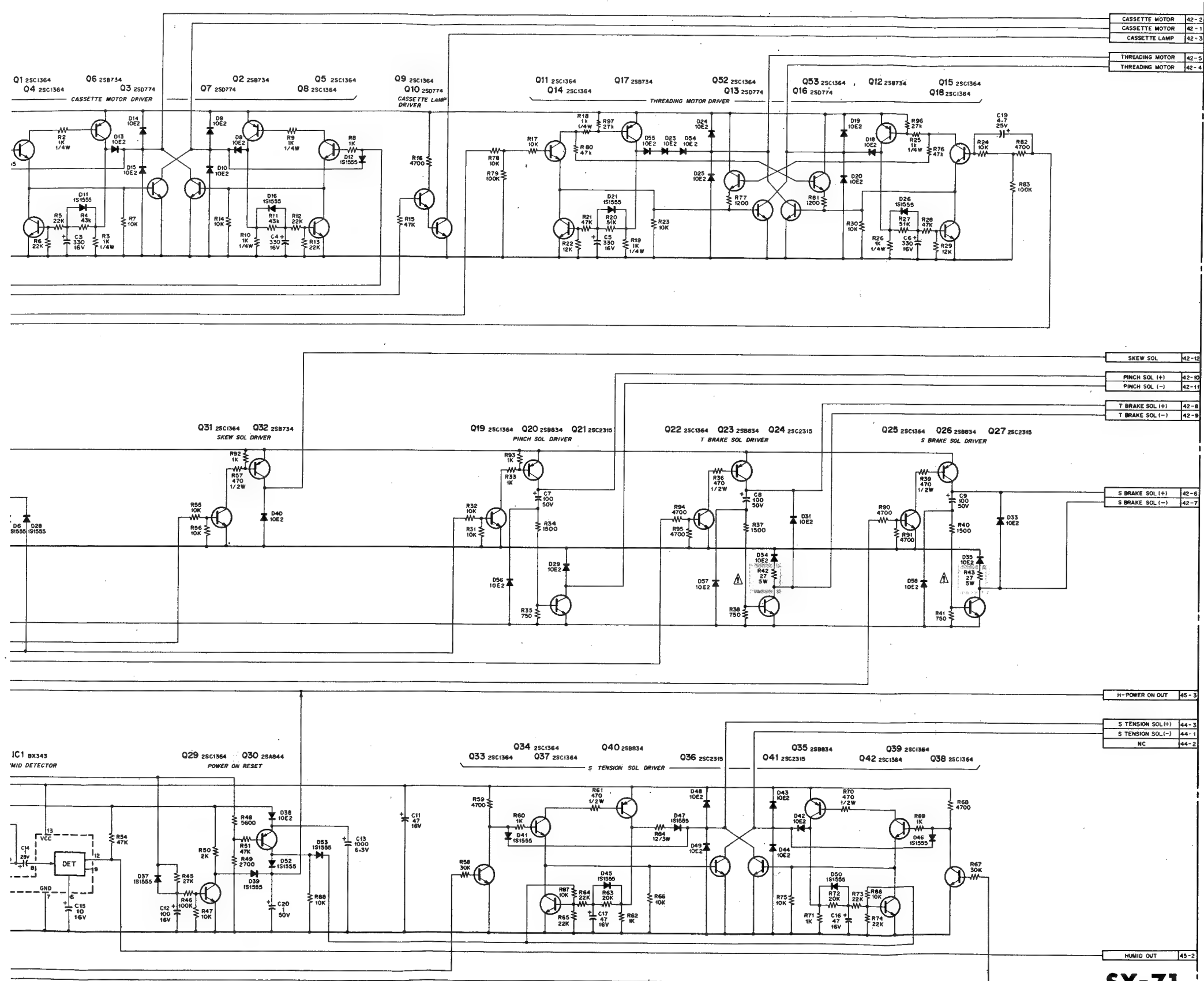


SY-71 — SOLDERING SIDE —  
1-604-356-14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

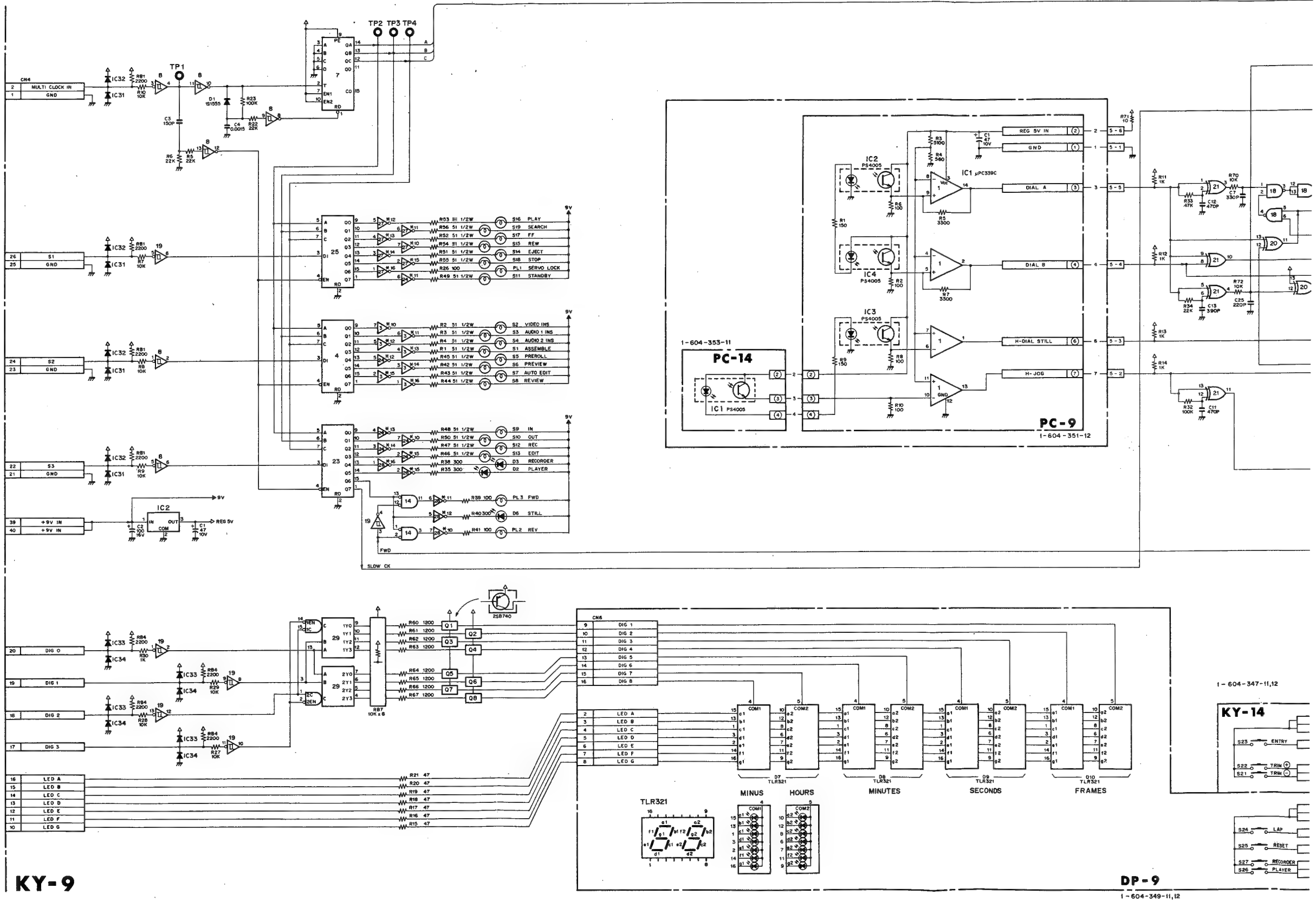


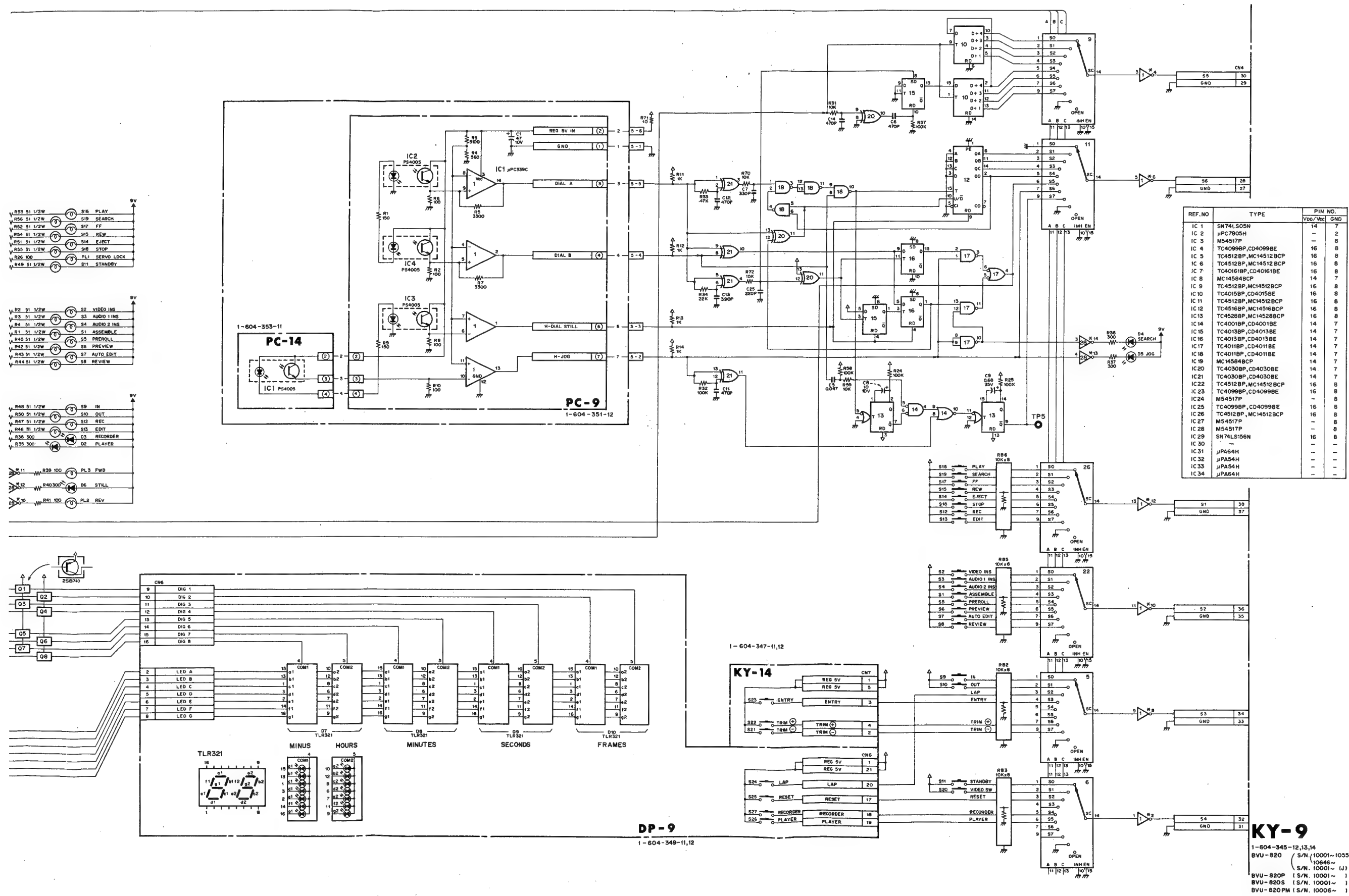
### SY-71 (MOTOR/SOLENOID DRIVER)



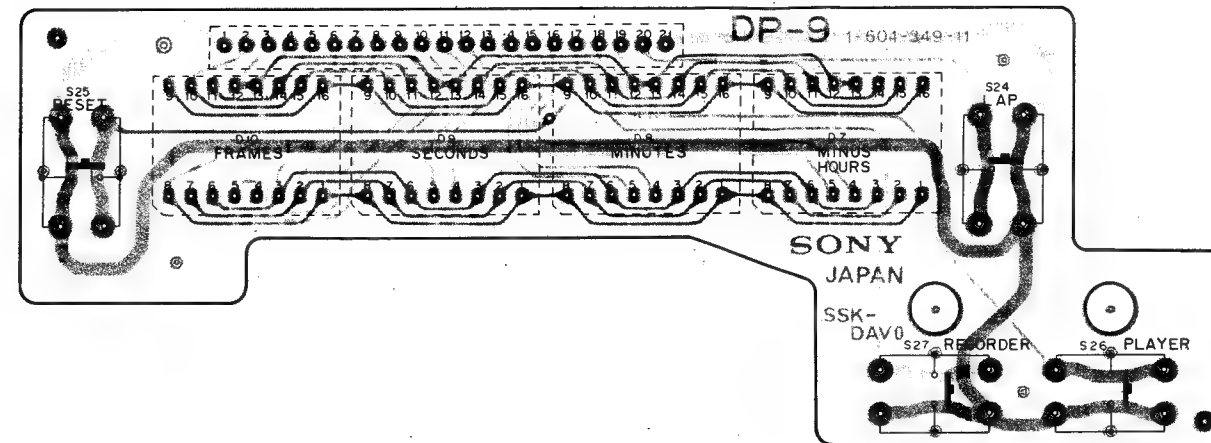
**SY-71**1-604-356-14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

KY-9, KY-14 (KEY BOARD)  
DP-9 (DISPLAY)  
PC-9, PC-14 (SEARCH DIAL)

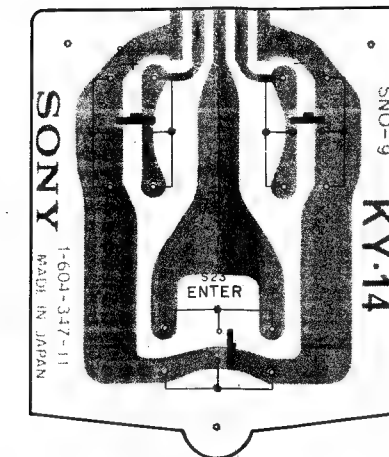




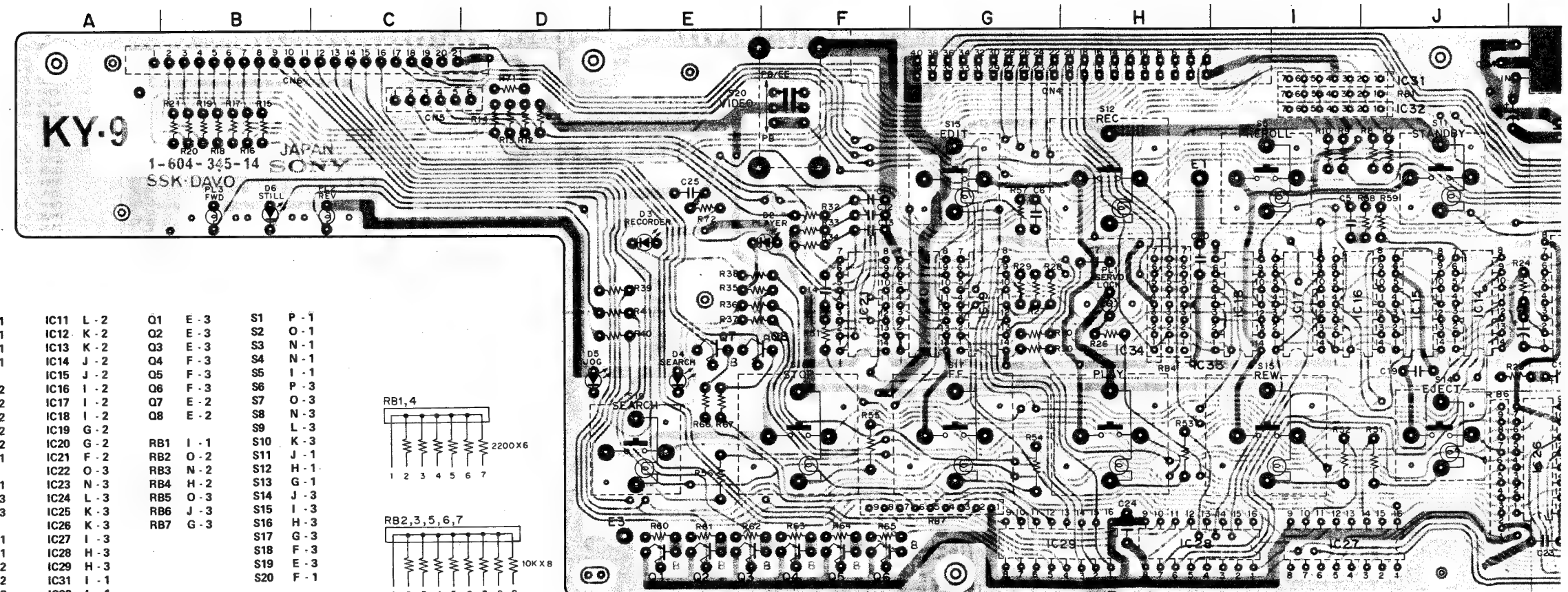
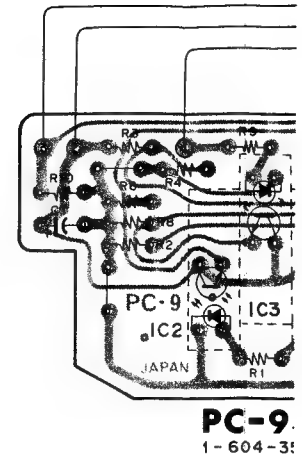
KY-9, KY-14, (KEY BOARD)  
DP-9 (DISPLAY)  
PC-9, PC-14 (SEARCH DIAL)



DP-9-SOLDERING SIDE-  
1-604-349-11,12

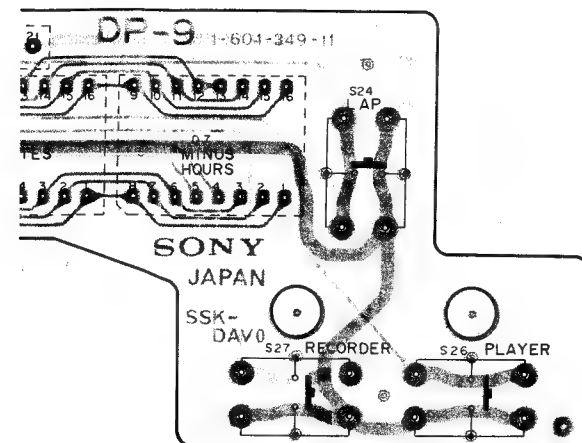


KY-14-SOLDERING SIDE-  
1-604-347-11,12

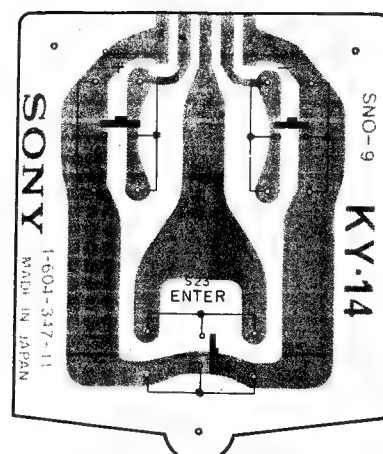


CN4 G-1	IC11 L-2	Q1 E-3	S1 P-1
CN5 C-1	IC12 K-2	Q2 E-3	S2 O-1
CN6 B-1	IC13 K-2	Q3 E-3	S3 N-1
CN7 L-1	IC14 J-2	Q4 F-3	S4 N-1
	IC15 J-2	Q5 F-3	S5 I-1
D1 N-2	IC16 I-2	Q6 F-3	S6 P-3
D2 E-2	IC17 I-2	Q7 E-2	S7 O-3
D3 E-2	IC18 I-2	Q8 E-2	S8 N-3
D4 E-2	IC19 G-2		S9 L-3
D5 E-2	IC20 G-2	RB1 I-1	S10 K-3
D6 B-1	IC21 F-2	RB2 O-2	S11 J-1
	IC22 O-3	RB3 N-2	S12 H-1
E1 H-1	IC23 N-3	RB4 H-2	S13 G-1
E2 P-3	IC24 L-3	RB5 O-3	S14 J-3
E3 E-3	IC25 K-3	RB6 J-3	S15 I-3
	IC26 K-3	RB7 G-3	S16 H-3
IC1 N-1	IC27 I-3		S17 G-3
IC2 K-1	IC28 H-3		S18 F-3
IC3 P-2	IC29 H-3		S19 E-3
IC4 O-2	IC31 I-1		S20 F-1
IC5 O-2	IC32 I-1		
IC6 N-2	IC33 H-2	TP1 M-1	
IC7 N-2	IC34 H-2	TP2 O-3	
IC8 M-2		TP3 O-3	
IC9 M-2		TP4 L-3	
IC10 L-2		TP5 L-3	

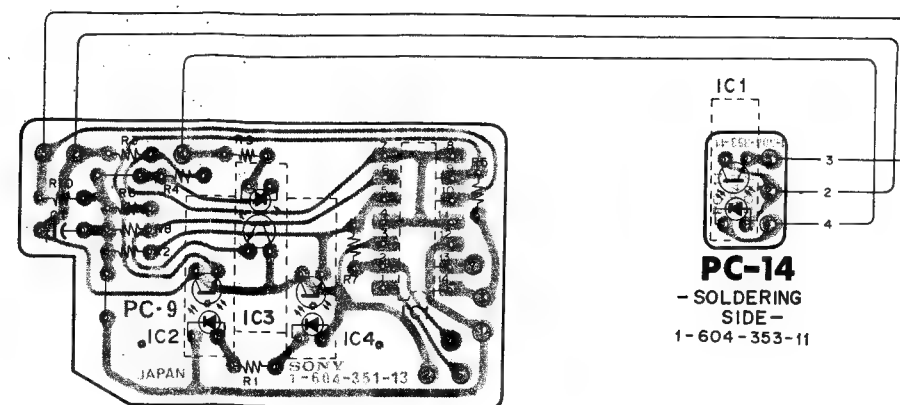




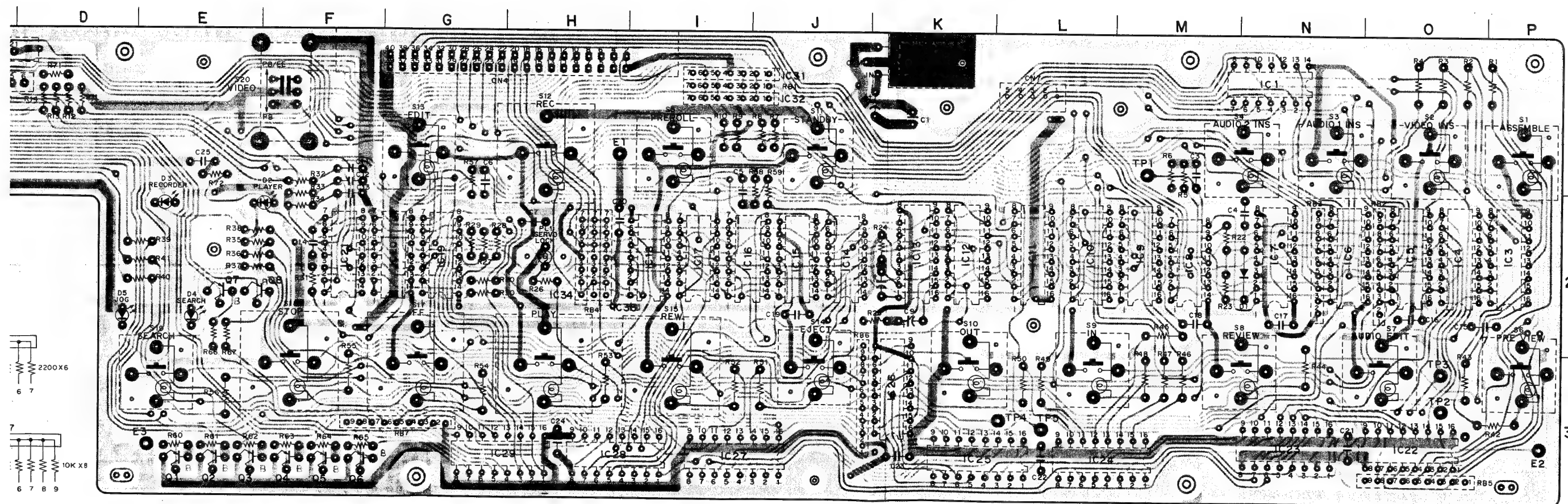
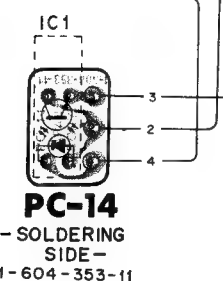
**DP-9-SOLDERING SIDE-**  
1-604-349-11,12



**KY-14-SOLDERING SIDE-**  
1-604-347-11,12



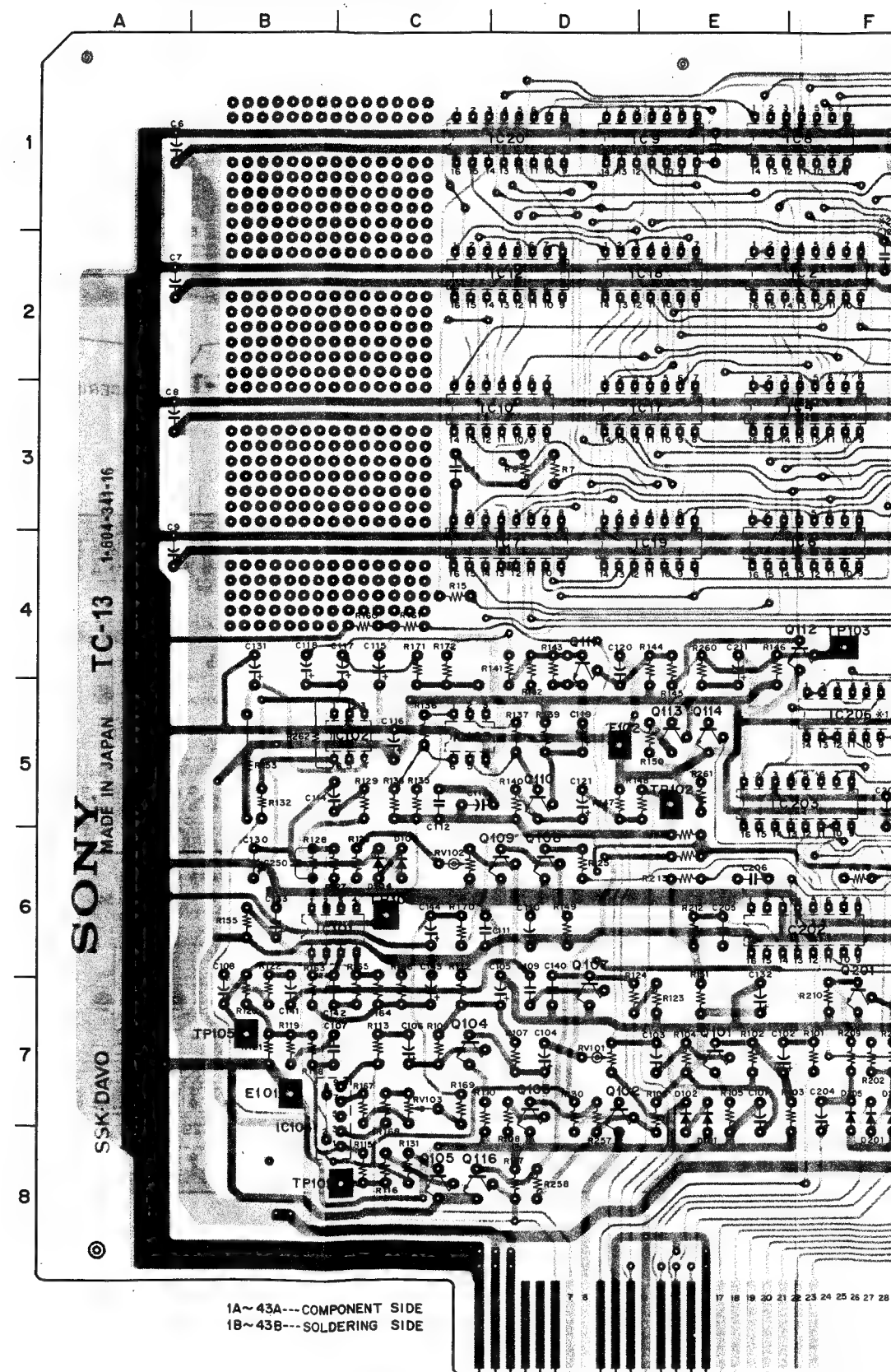
**PC-9-SOLDERING SIDE-**  
1-604-351-13



**KY-9-SOLDERING SIDE-**  
1-604-345-14  
BVU-820 (S/N. 10001~10550 (U/C))  
BVU-820P (S/N. 10001~) (U/C)  
BVU-820S (S/N. 10001~) (J)  
BVU-820M (S/N. 10006~)

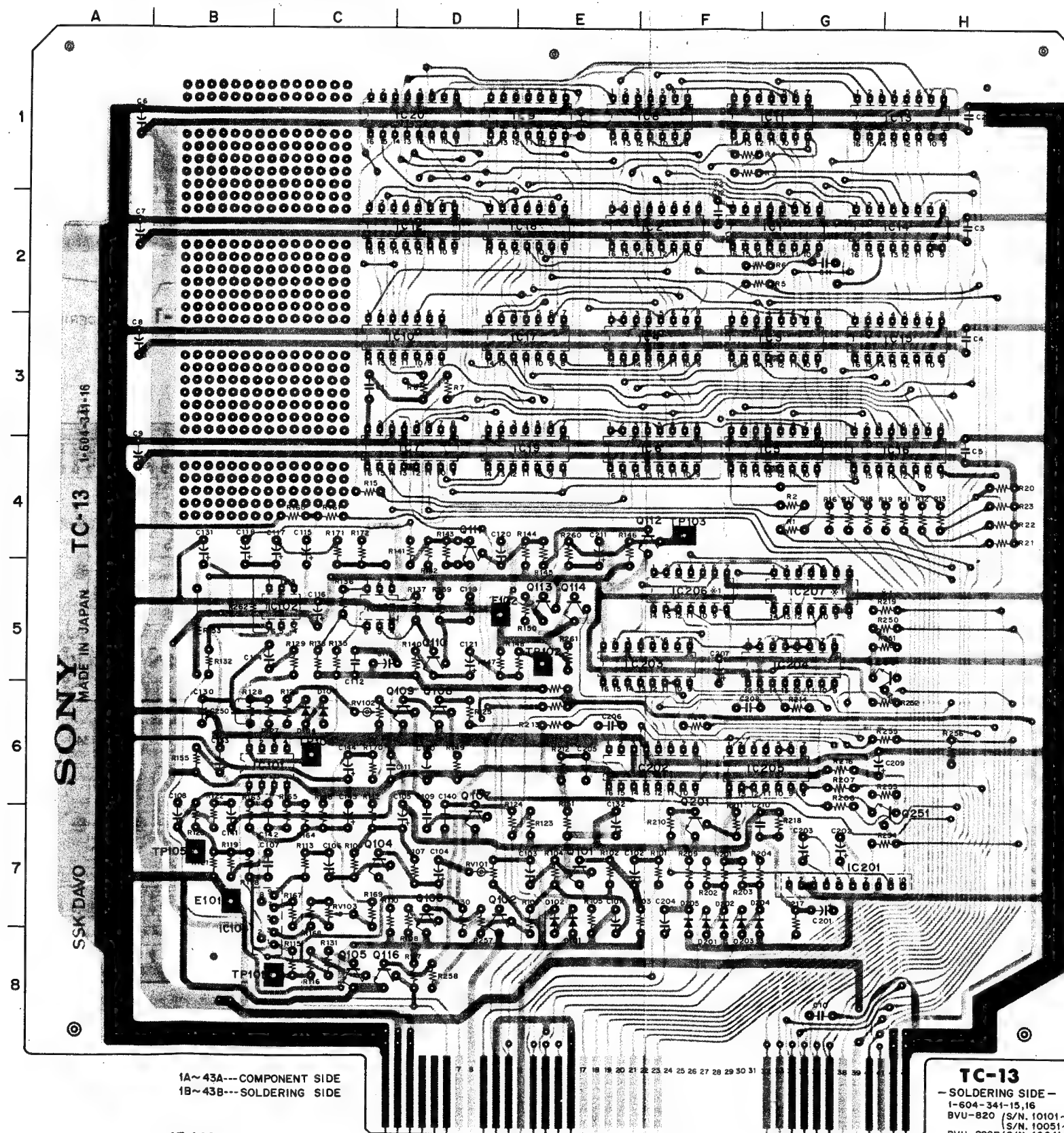
TC-13 (TIME CODE REC/PB AMPLIFIER)  
(CTL COUNTER)  
(SERVO REF SYNC SELECTOR)

Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)



TC-13 (TIME CODE REC/PB AMPLIFIER)  
(CTL COUNTER)  
(SERVO REF SYNC SELECTOR)

Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)



D101 E-7  
D102 E-7  
D103 E-6  
D104 C-6  
D201 F-7  
D202 F-7  
D203 F-7  
D204 G-7  
D205 F-7

E101 B-7  
E102 D-5

IC1 G-2  
IC2 F-2  
IC3 G-3  
IC4 F-3  
IC5 G-4  
IC6 F-4  
IC7 D-4  
IC8 F-1  
IC9 E-1  
IC10 D-3  
IC11 G-1  
IC12 D-2  
IC13 H-1  
IC14 H-2  
IC15 H-3  
IC16 H-4  
IC17 E-3  
IC18 E-2  
IC19 E-4  
IC20 D-1  
IC101 B-6  
IC102 C-5  
IC103 C-5  
IC104 B-7  
IC201 G-7  
IC202 F-6  
IC203 F-5  
IC204 G-5  
IC205 G-6  
IC206 F-5  
IC207 G-5

Q101 E-7  
Q102 D-7  
Q103 D-7  
Q104 C-7  
Q105 C-8  
Q107 D-7  
Q108 D-6  
Q109 D-6  
Q110 D-5  
Q111 D-4  
Q112 F-4  
Q113 E-5  
Q114 E-5  
Q116 C-8  
Q201 F-7  
Q250 H-5  
Q251 H-7

RV101 D-7  
RV102 C-6  
RV103 C-7

TP101 C-8  
TP102 E-5  
TP103 F-4  
TP104 C-6  
TP105 B-7

NOTE (1)

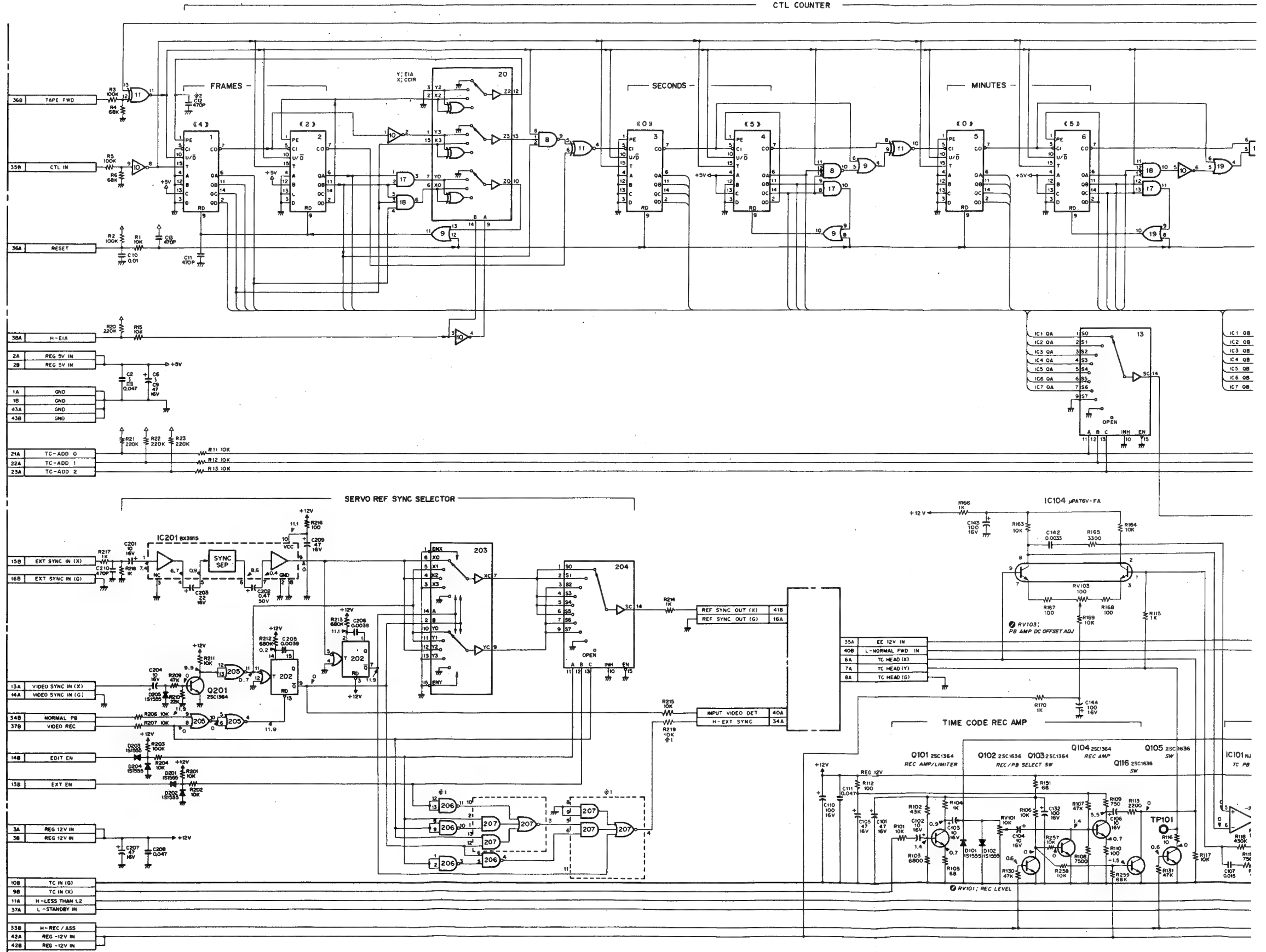
		NTSC/PM	PAL/SECAM
①	IC206 IC207 R219	NOT MOUNTED	MOUNTED
②	C12	MOUNTED	NOT MOUNTED

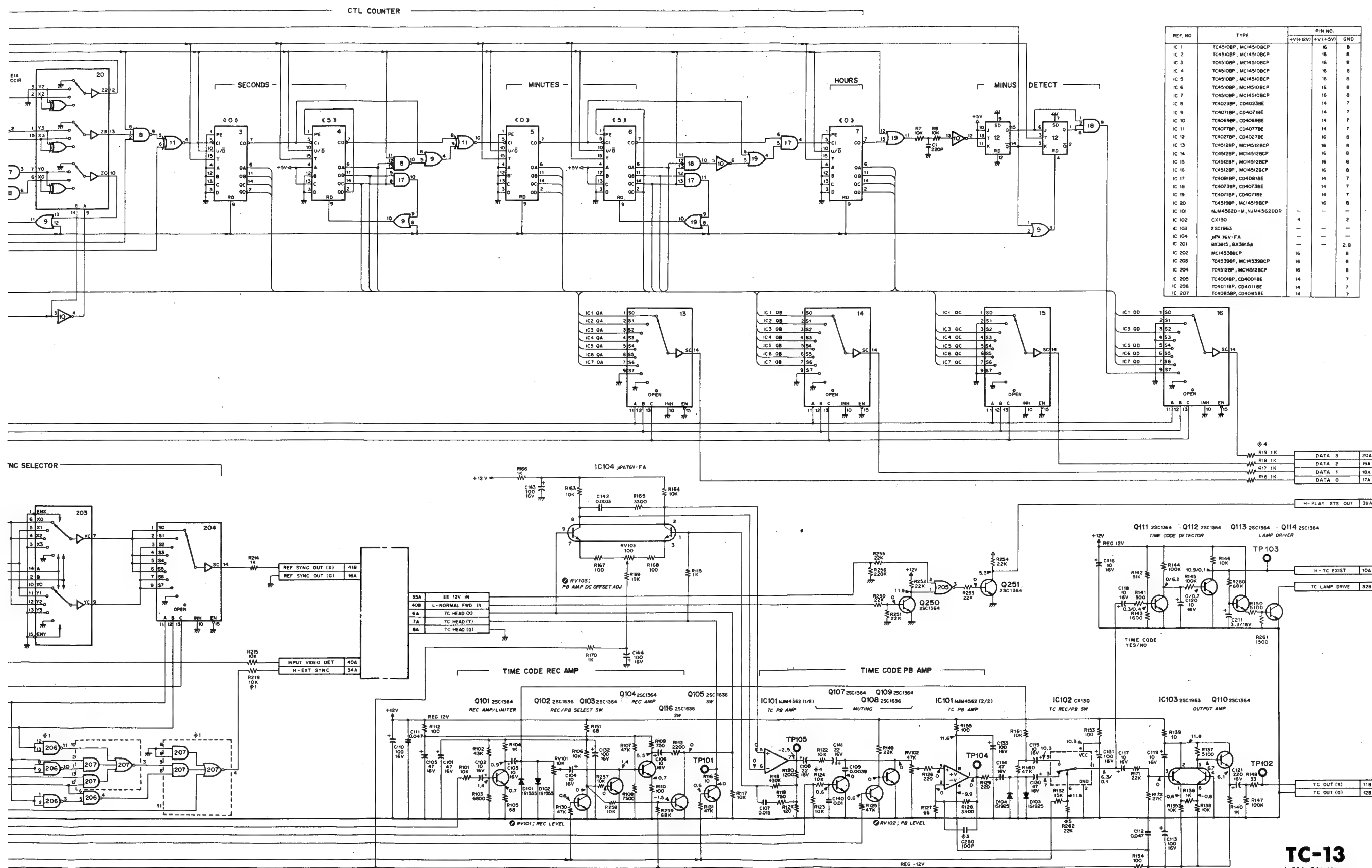


TC-13 (TIME CODE REC/PB AMPLIFIER)  
(CTL COUNTER)  
(SERVO REF SYNC SELECTOR)

Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)

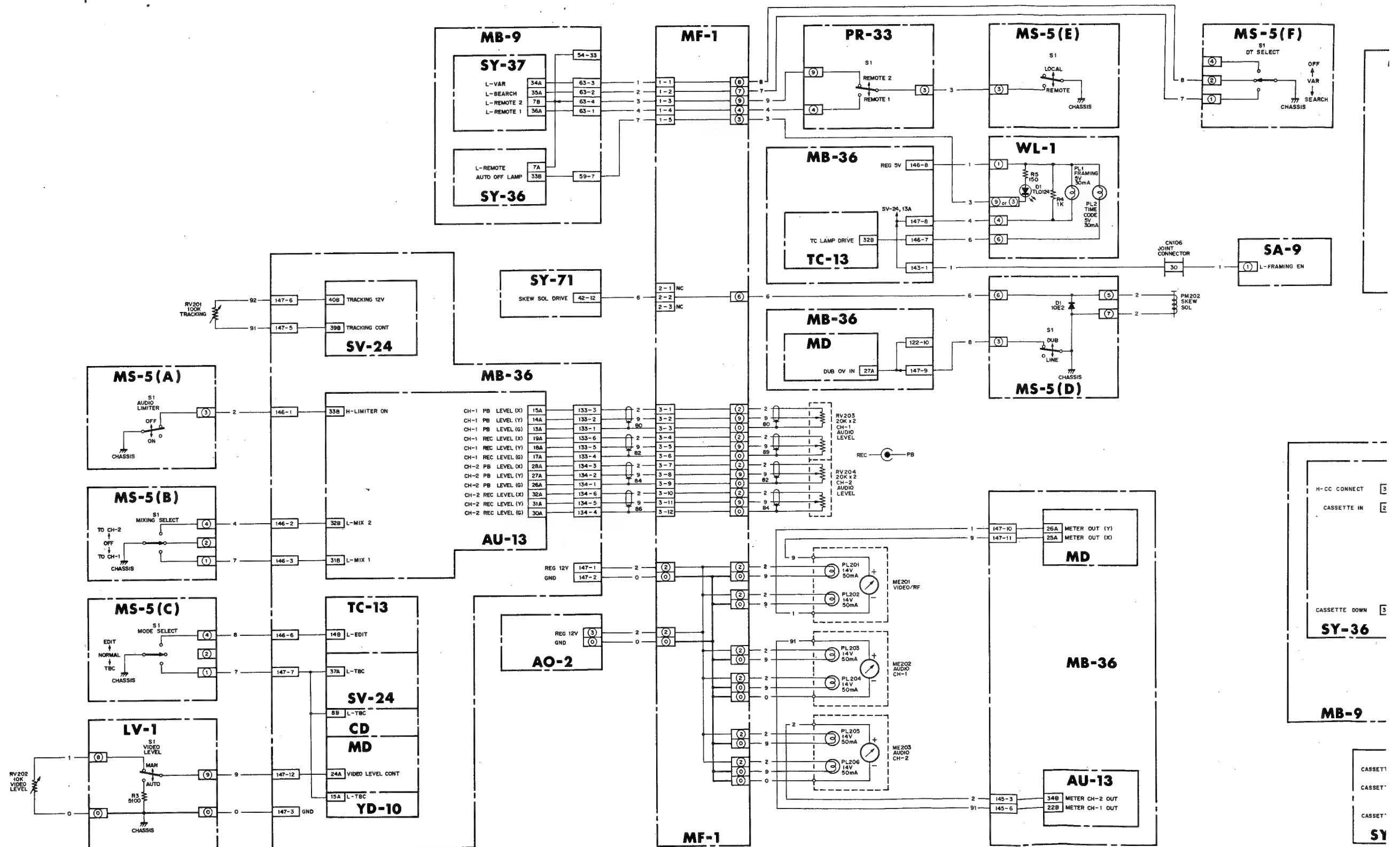
MARK	CHANGE INFORMATION	SERIAL NO.
1	IC206 NTSC/PM NOT MOUNTED IC207 PAL/SECAM MOUNTED	
2	C12 NTSC/PM MOUNTED PAL/SECAM NOT MOUNTED	
3	C250 100P ADDED	10101~(U/C) 10051~(J) 10041~(PAL) 10001~(SECAM) 10001~(PM)
4	R16, 17, 18, 19 10K → 1K R124 47K → 10K	10646~(U/C) 10201~(J) 10501~(PAL) 10051~(SECAM) 10006~(PM)
5	R262 22K ADDED	11508~(U/C) 10481~(J) 11526~(PAL) 10071~(SECAM) 10021~(PM)



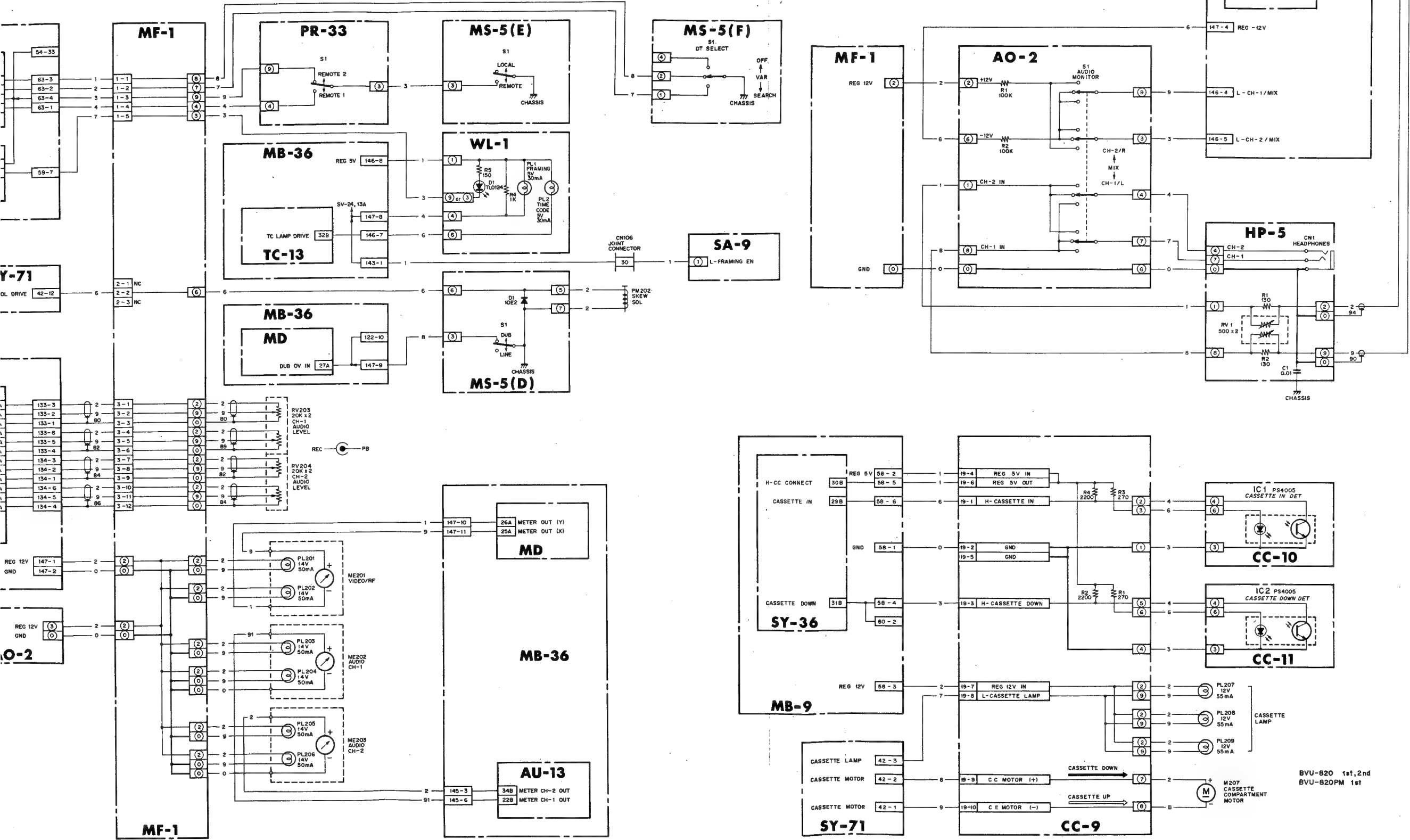


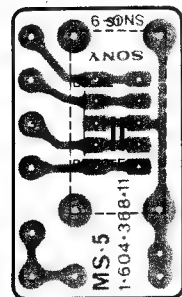
FRAME (1)

FRONT CHASSIS

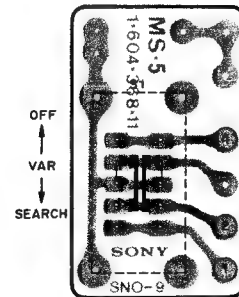


ONT CHASSIS

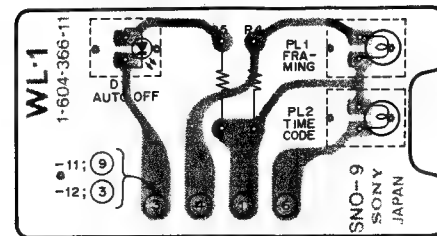




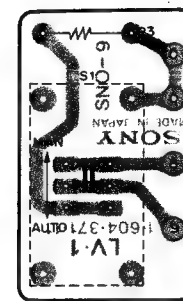
**MS-5(E)**  
- SOLDERING SIDE -  
1-604-368-11



**MS-5(F)**  
- SOLDERING SIDE -  
1-604-368-11



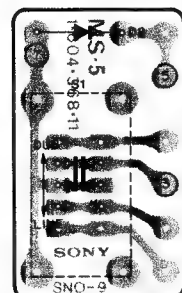
**WL-1** - SOLDERING SIDE -  
1-604-366-11, 12



**LV-1**  
- SOLDERING SIDE -  
1-604-371-11

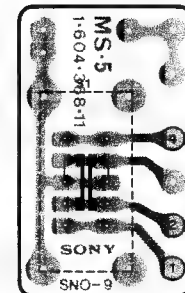


**PR-33**  
- SOLDERING SIDE -  
1-604-511-12

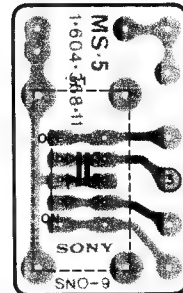


**MS-5(D)**  
- SOLDERING SIDE -  
1-604-368-11

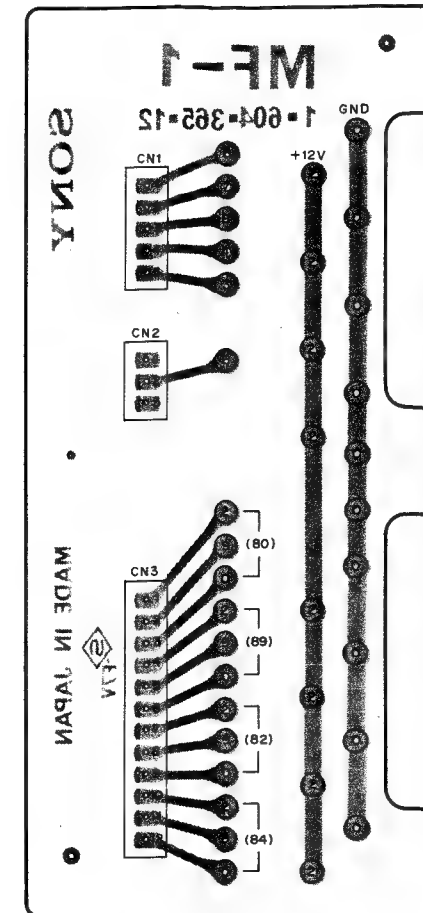
MS-5(C)	MS-5(B)
EDIT	TO CH-2
NORMAL	OFF
TBC	TO CH-1



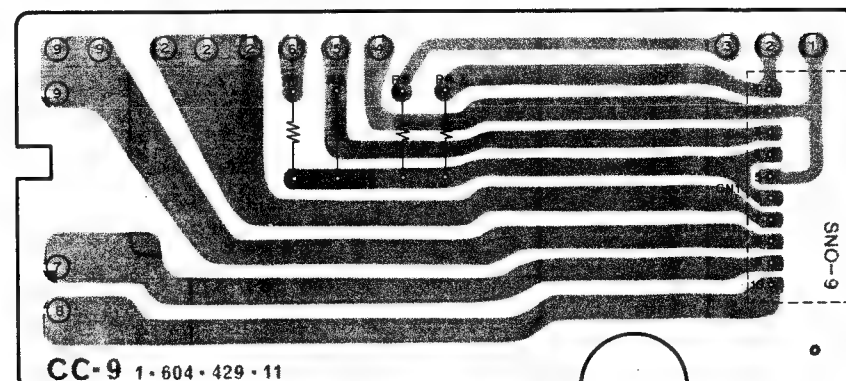
**MS-5(B)(C)**  
- SOLDERING SIDE -  
1-604-368-11



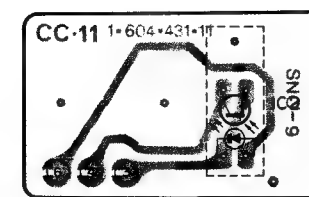
**MS-5(A)**  
- SOLDERING SIDE -  
1-604-368-11



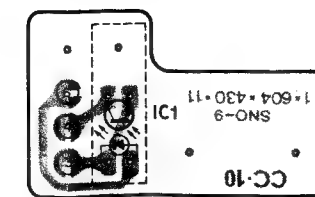
**MF-1** - COMPONENT SIDE -  
1-604-365-12



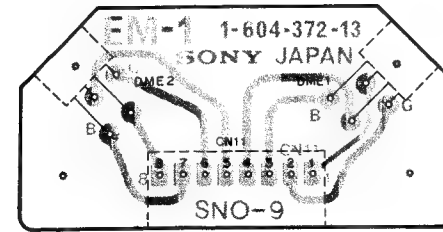
**CC-9** - SOLDERING SIDE -  
1-604-429-11, 12



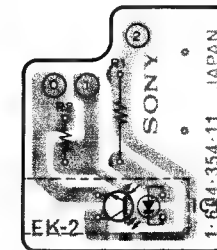
**CC-11** - SOLDERING SIDE -  
1-604-431-11, 12



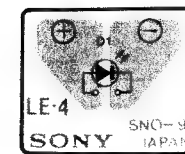
**CC-10** - SOLDERING SIDE -  
1-604-430-11, 12  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM



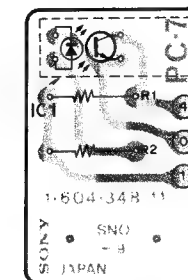
**EM-1** - SOLDERING SIDE -  
1-604-372-13



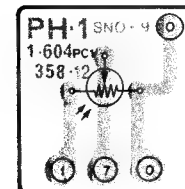
**EK-2** - SOLDERING SIDE -  
1-604-354-11, 12



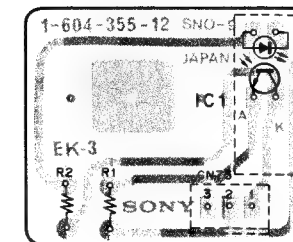
**LE-4** - SOLDERING SIDE -  
1-604-357-11



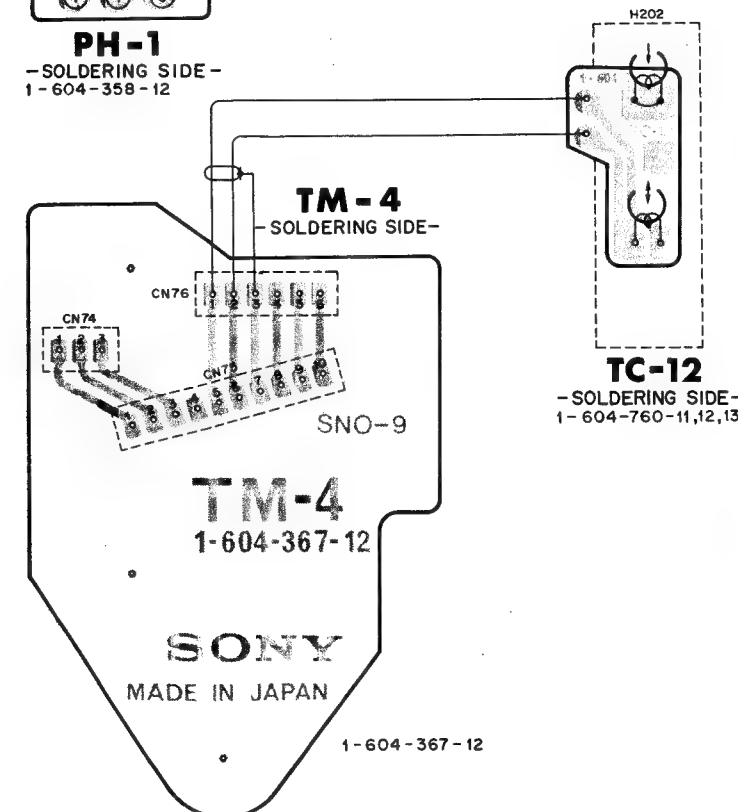
**PC-7** - SOLDERING SIDE -  
1-604-348-11



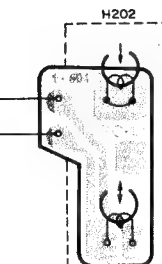
**PH-1** - SOLDERING SIDE -  
1-604-358-12



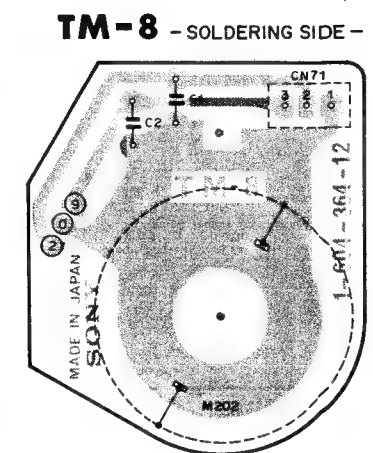
**EK-3** - SOLDERING SIDE -  
1-604-355-12



**TM-4** - SOLDERING SIDE -



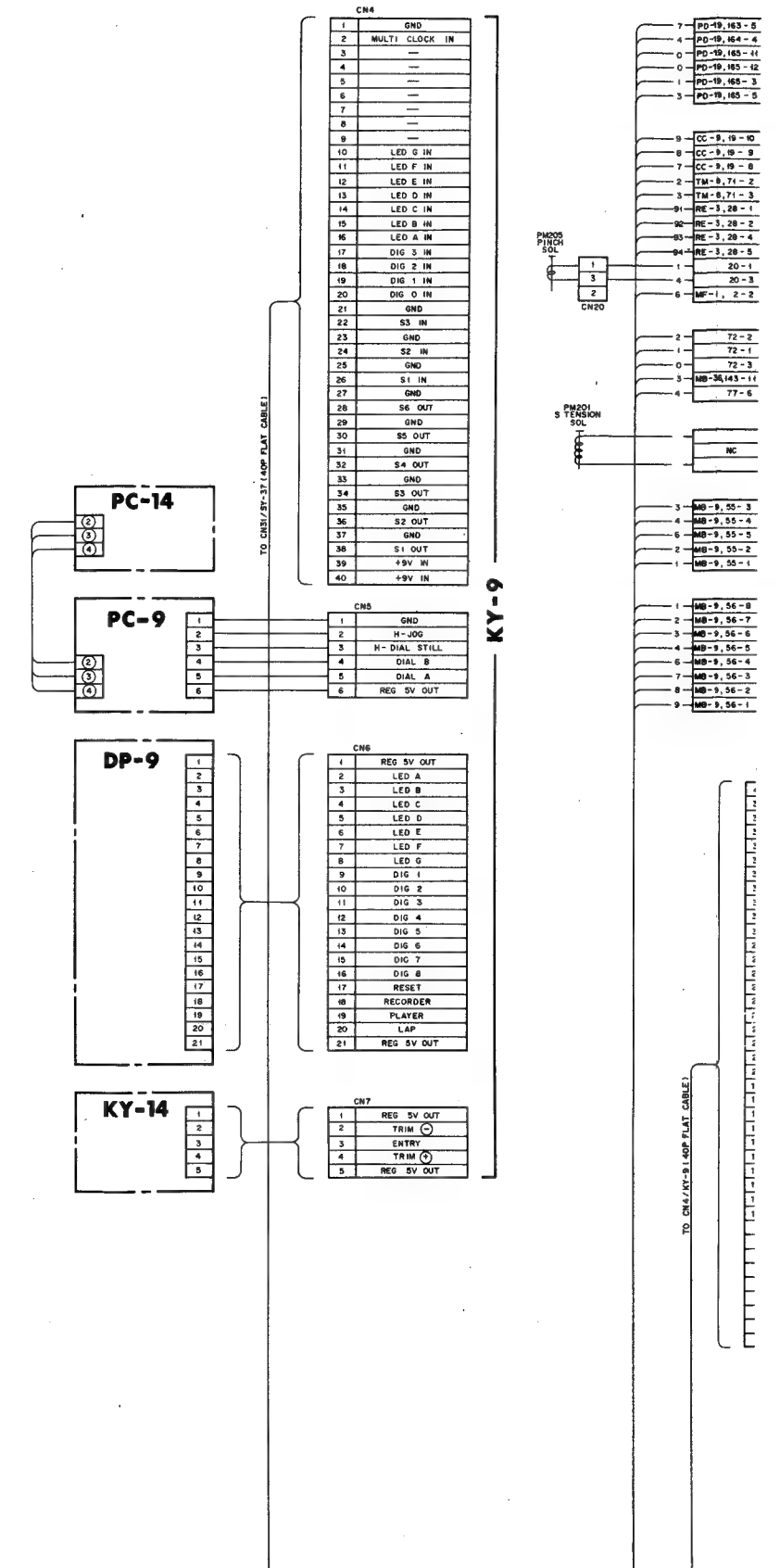
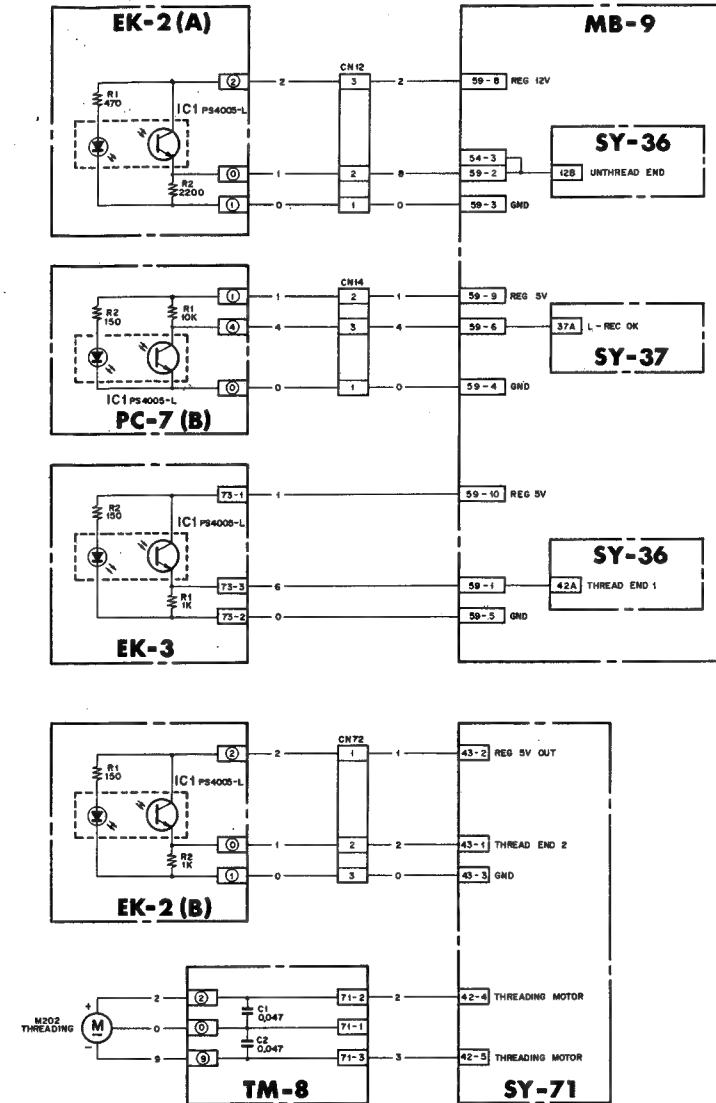
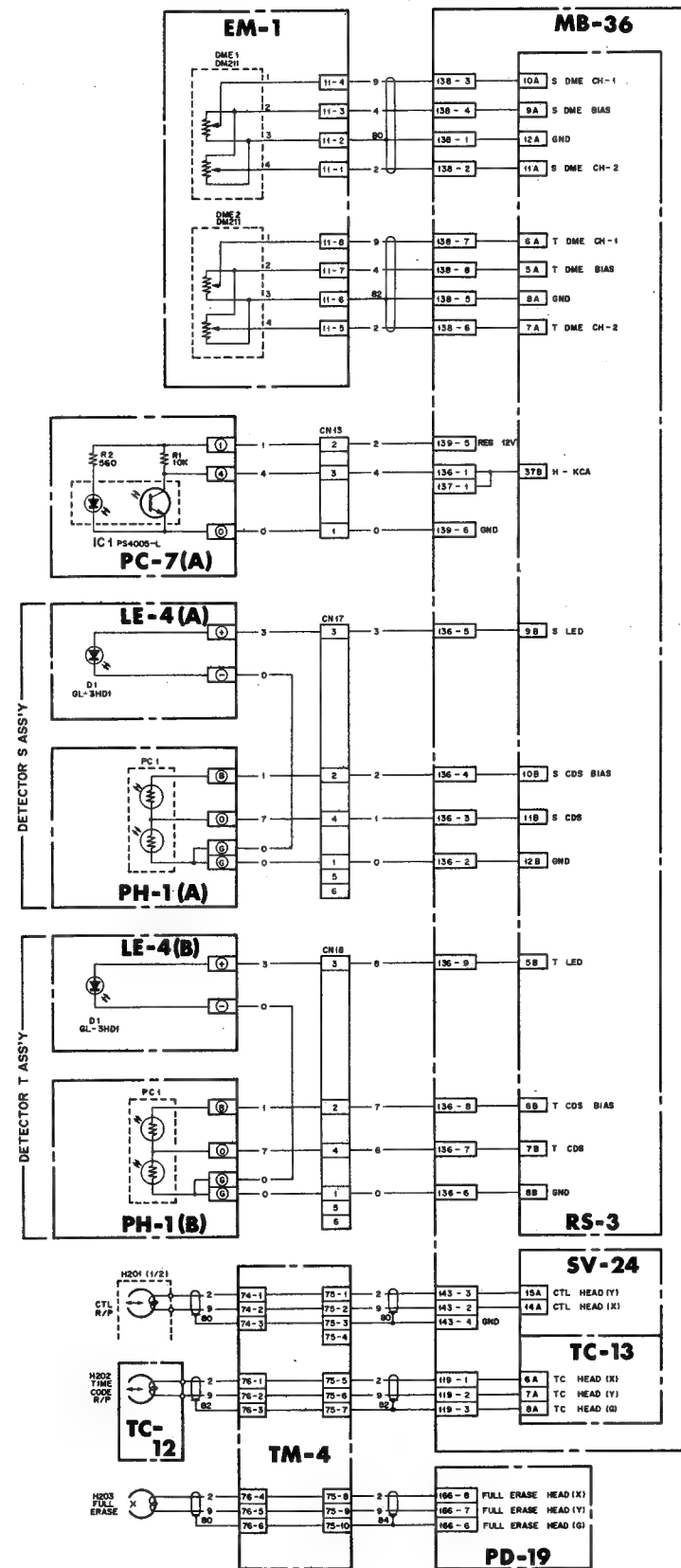
**TC-12** - SOLDERING SIDE -  
1-604-760-11, 12, 13



**TM-8** - SOLDERING SIDE -

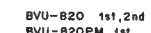
1-604-364-12, 13, 14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

FRAME (2)





**FRAME (2) (MB-9)**





FRAME (3)

CN118			
JO CN, 105-4	1	CH-1 MIX	146-8
JO CN, 105-5	2	CH-2 MIX	146-5
JO CN, 105-21	3	EXT SYNC (X)	111-168
JO CN, 105-20	4	EXT SYNC (X)	111-158
JO CN, 105-31	5	EXT EN	111-158
JO CN, 105-10	6	TC OUT (G)	111-128
JO CN, 105-9	7	TC OUT (X)	111-118
JO CN, 105-8	8	TC IN (G)	111-108
JO CN, 105-48	9	TC IN (X)	111-98
JO CN, 105-38	10	EXT SC IN (G)	112-58
JO CN, 105-39	11	EXT SC IN (X)	112-68
PD-19, 164-5	12	FULL ERASE CONT	111-338 115-218 117-288
CN119			
TM-4, 75-5	1	TC HEAD (X)	111-6A
TM-4, 75-6	2	TC HEAD (Y)	111-7A
TM-4, 75-7	3	TC HEAD (G)	111-8A
CN120			
MB-36, OPEN	1		111-15A
MB-36, OPEN	2		111-16A
MB-9, 61-11	3	DATA 0	111-17A
MB-9, 61-10	4	DATA 1	111-18A
MB-9, 61-9	5	DATA 2	111-19A
MB-9, 61-12	6	GND	
MB-9, 61-7	7	DATA 3	111-20A
MB-9, 61-6	8	TC-ADD 0	111-21A
MB-9, 61-5	9	TC-ADD 1	111-22A
MB-9, 61-8	10	GND	
MB-36, 144-10	11	PB BURST PULSE (X)	112-21A
MB-36, OPEN	12	GND	
CN121			
MB-9, 61-3	1	TC-ADD 2	111-23A
MB-9, 61-1	2	TC-ADD 3	111-24A
MB-9, 61-2	3	CMD / DATA	111-25A
MB-9, 61-4	4	GND	
MB-9, 62-5	5	STS / DATA	111-26A
MB-9, 62-7	6	WRITE (LATCH)	111-27A
MB-9, 62-6	7	DO	111-28A
MB-9, 62-1	8	GND	
MB-9, 62-1	9	D1	111-29A
MB-9, 62-3	10	D2	111-30A
MB-9, 62-2	11	D3	111-31A
MB-9, 62-4	12	GND	
CN122			
JO CN, 106-29	1	SLAVE DUB OV IN	112-30B
JO CN, 106-36	2	C DUB OUT (X)	112-31B
JO CN, 106-37	3	C DUB OUT (G)	112-32B
JO CN, 106-34	4	VIDEO 1 OUT (X)	112-33B
JO CN, 106-34	5	VIDEO 1 OUT (G)	112-34B
JO CN, 106-35	6	VIDEO 2 OUT (X)	112-35B
JO CN, 106-35	7	VIDEO 2 OUT (G)	112-36B
JO CN, 106-37	8	VIDEO 3 OUT (X)	112-37B
JO CN, 106-38	9	VIDEO 3 OUT (G)	112-38B
JO CN, 106-28	10	DUB EN	114-30A
CN123			
RP-10, 97-4	1	H-DT SW ON	113-188 124-5
RP-10, 97-2	2	CH-A PB RF IN (X)	113-58
RP-10, 97-3	3	CH-B PB RF IN (G)	113-68
RP-10, 97-5	4	CH-B PB RF IN (X)	113-78
RP-10, 97-6	5	CH-B PB RF IN (G)	113-88
CN124			
DT-3, 701-1	1	DT ENV OUT	114-238 117-288 119-288
DT-3, 702-2	2	H-CONF OUT	114-268 117-318 119-318
DT-3, 702-3	3	H-DT ON IN	112-288 115-198 116-28A
DT-3, 701-2	4	DT SW PULSE	114-388 123-1
DT-3, 701-3	5	H-DT SW ON	113-188 123-1
DT-3, 703-4	6	L-PP / REW	113-158 142-7
DT-3, 704-10	7	TBC DO PULSE (G)	113-12A 149-3
DT-3, 704-9	8	TBC DO PULSE (X)	113-11A 112-34A 149-1
DT-3, 701-7	9	PUNCH ON (G)	117-58 142-6
DT-3, 702-1	10	L-DRAW LOCK OUT	117-40A 124-4
DT-3, 703-5	11	H SYNC (X)	
DT-3, 703-6	12	H SYNC (G)	
CN125			
PD-19, 163-6	1	REG -12V	NC
PD-19, 164-5	2	REG 12V	NC
JO CN, 106-43	3	REG 5V	
PD-19, 165-1	4	REG 5V	
PD-19, 165-7	5	GND	
PD-19, 165-8	6	GND	
JO CN, 106-8	7	GND	
CN126			
RM-4, 104-4	1	L-DRAW LOCK OUT	117-40A 124-4
RM-4, 104-7	2	CAP LOCK OUT	117-39A
RM-4, 104-6	3	SYNCHRONIZE IN	117-38A
RP-10, 94-3	4	REC EN	114-36A
RP-10, 94-7	5	REC A	114-35A
RP-10, 94-8	6	REC B	114-34A
RP-10, 91-1	7	RE MUTE A	114-33A
RP-10, 91-4	8	RE MUTE B	114-32A

CN127			
JO CN, 106-38	1	LINE IN (X)	114-5A
JO CN, 106-38	2	LINE IN (G)	114-6A
JO CN, 106-16	3	Y DUB IN (X)	114-7A
JO CN, 106-17	4	Y DUB IN (G)	114-8A
JO CN, 106-18	5	C DUB IN (X)	114-9A
JO CN, 106-19	6	C DUB IN (G)	114-10A
RP-10, 94-4	7	REC Y RF OUT (X)	114-11A
RP-10, 94-5	8	REC Y RF OUT (G)	114-12A
RP-10, 94-1	9	REC C RF OUT (X)	114-13A
RP-10, 94-2	10	REC C RF OUT (G)	114-14A
NC	11	NC	
NC	12	NC	
CN128			
JO CN, 106-34	1	Y DUB OUT (X)	113-13A
JO CN, 106-35	2	Y DUB OUT (G)	113-14A
JO CN, 106-14	3	OFF TAPE ST OUT (X)	114-21A
JO CN, 106-15	4	OFF TAPE ST OUT (G)	114-22A
MB-36, 144-12	5	REF BURST IN (X)	114-40A
MB-36, OPEN	6	GND	
CN129			
PD-19, 163-7	1	REG -12V	
PD-19, 164-6	2	REG 12V	
PD-19, 165-8	3	GND	
CN130			
JO CN, 106-1	1	CH-1 MIC IN (X)	115-12B
JO CN, 106-2	2	CH-1 MIC IN (Y)	115-13B
JO CN, 106-3	3	CH-1 MIC IN (G)	115-14B
CN131			
JO CN, 106-40	1	CH-2 MIC IN (X)	115-27B
JO CN, 106-41	2	CH-2 MIC IN (Y)	115-28B
JO CN, 106-42	3	CH-2 MIC IN (G)	115-29B
CN132			
H201 (2/2)	1	CH-1 AUDIO HEAD (X)	115-4A
H201 (2/2)	2	CH-1 AUDIO HEAD (Y)	115-5A
H201 (2/2)	3	CH-1 AUDIO HEAD (G)	115-6A
NC	4	GND	
NC	5	GND	
H201 (2/2)	6	CH-2 AUDIO HEAD (X)	115-8A
H201 (2/2)	7	CH-2 AUDIO HEAD (Y)	115-9A
H201 (2/2)	8	CH-2 AUDIO HEAD (X)	115-10A
CN133			
MF-1, 3-3	1	CH-1 PB LEVEL (G)	115-15A
MF-1, 3-2	2	CH-1 PB LEVEL (Y)	115-16A
MF-1, 3-1	3	CH-1 PB LEVEL (X)	115-17A
MF-1, 3-6	4	CH-1 REC LEVEL (G)	115-18A
MF-1, 3-5	5	CH-1 REC LEVEL (Y)	115-19A
MF-1, 3-4	6	CH-1 REC LEVEL (X)	115-20A
JO CN, 106-25	7	CH-1 AUDIO OUT (X)	115-21A
JO CN, 106-26	8	CH-1 AUDIO OUT (G)	115-22A
CN134			
MF-1, 3-8	1	CH-2 PB LEVEL (G)	115-26A
MF-1, 3-7	2	CH-2 PB LEVEL (Y)	115-27A
MF-1, 3-6	3	CH-2 PB LEVEL (X)	115-28A
MF-1, 3-12	4	CH-2 REC LEVEL (G)	115-30A
MF-1, 3-11	5	CH-2 REC LEVEL (Y)	115-31A
MF-1, 3-10	6	CH-2 REC LEVEL (X)	115-32A
JO CN, 106-27	7	CH-2 AUDIO OUT (X)	115-34A
JO CN, 106-28	8	CH-2 AUDIO OUT (G)	115-35A
CN135			
H201 (2/2)	1	CH-2 ERASE HEAD (G)	115-39B
H201 (2/2)	2	CH-2 ERASE HEAD (Y)	115-40B
H201 (2/2)	3	CH-2 ERASE HEAD (X)	115-41B
H201 (2/2)	4	CH-1 ERASE HEAD (X)	115-39A
H201 (2/2)	5	CH-1 ERASE HEAD (Y)	115-40A
H201 (2/2)	6	CH-1 ERASE HEAD (G)	115-41A
CN136			
13-3	1	KCA	116-37B 137-1
17-1	2	S GND	116-12B
17-4	3	S COS	116-11B
17-2	4	S COS BIAS	116-10B
17-3	5	S LED	116-9B
18-1	6	T GND	116-8B
18-4	7	T COS	116-7B
18-2	8	T COS BIAS	116-6B
18-3	9	T LED	116-5B
NC	10	NC	
CN137			
NC	1	REG 5V	116-37B 136-1
NC	2	REG 5V	116-38B
NC	3	REG 5V	116-39B
NC	4	GND	
CN138			
EM-1, 11-2	1	S DME GND	116-12A
EM-1, 11-1	2	S DME CH-2	116-11A
EM-1, 11-4	3	S DME CH-1	116-10A
EM-1, 11-5	4	S DME BIAS	116-9A
EM-1, 11-6	5	T DME GND	116-8A
EM-1, 11-7	6	T DME CH-2	116-7A
EM-1, 11-8	7	T DME CH-1	116-6A
EM-1, 11-9	8	T DME BIAS	116-5A

CN139			
PD-19, 165-9	1	GND	
PD-19, 165-2	2	REG 5V	
PD-19, 164-7	3	REG 12V	
PD-19, 165-4	4	+15V	
13-2	5	REG 12V	
13-1	6	GND	
PD-19, 167-3	7	T MOTOR ERROR	116-13A
RE-3, 24-5	8	S CURRENT GND	116-18A
RE-3, 24-4	9	S MOTOR CURRENT	116-17A
RE-3, 24-1	10	T CURRENT GND	116-16A
RE-3, 24-2	11	T MOTOR CURRENT	116-15A
PD-19, 167-1	12	S MOTOR ERROR	116-14A
CN140			
PD-19, 163-4	1	REG -12V	
PD-19, 163-8	2	REG -12V	
PD-19, 165-10	3	GND	
CN141			
DT-3, 701-11	1	GND	
DT-3, 701-8	2	REG 5V	
DT-3, 701-40	3	REG 12V	
DT-3, 702-6	4	L-SERVO LOCK	117-68 113-31A 112-31A 142-36
DT-3, 702-11	5	TAPE FWD OUT	117-288 112-288 111-368
DT-3, 703-5	6	H-DT ON IN	117-288
DT-3, 704-7	7	L-CL2	117-108 142-24
DT-3, 702-4	8	CTL	117-318 116-31A
DT-3, 703-12	9	H-S MOTOR OFF	116-248 142-14
DT-3, 701-9	10	REG -12V	
CN143			
JO CN, 106-30	1	FRAMING EN IN	117-13A 147-8
TM-4, 75-2	2	CTL HEAD (Y)	117-14A
TM-4, 75-3	3	CTL HEAD (X)	117-15A
TM-4, 75-3	4	GND	
78-5	5	PHASE PG (X)	117-17A
78-6	6	GND	
78-1	7	SPEED PG A	117-19A
78-2	8	GND	
78-3	9	SPEED PG B	117-20A
74-4	10	GND	
BY-71, 43-4	11	SKREW	117-20B
RM-4, 104-3	12	REMOTE CTL OUT	117-35A
CN144			
79-6	1	DME VCC	117-21A
79-5	2	DME A	117-22A 150-1
79-8	3	DME B	117-23A 150-2
79-7	4	DME GND	117-24A 150-3
PD-19, 167-7	5	CAP ERROR OUT (X)	117-25A
PD-19, 167-8	6	CAP ERROR OUT (G)	117-26A
PD-19, 167-6	7	CAP POL	117-27A
PD-19, 166-4	8	DRUM ERROR OUT	117-28A
PD-19, 166-12	9	DRUM CURRENT	117-29A
MB-36, 120-110	10	PB BURST PULSE	117-30A
MB-36, OPEN	11	REF SYNC	117-31A 111-418
MB-36, 120-5	12	REF BURST PULSE	117-32A
CN145			
HP-5, 2	1	CH-2 HEAD PHONE (G)	115-37B
HP-5, 2	2	CH-2 HEAD PHONE (X)	115-38B
A3 METER	3	CH-2 METER	115-34B
HP-5, 2	4	CH-1 HEAD PHONE (G)	115-25B
HP-5, 2	5	CH-1 HEAD PHONE (X)	115-26B
A1 METER	6	CH-1 METER	115-22B
CN146			
MS-5(A)	1	L-METER ON/OFF	115-33B
MS-5(B)	2	MIX-2	115-32B
MS-5(B)	3	MIX-1	115-31B
AD-2	4	CH-1 MIX	118-1
AD-2	5	CH-2 MIX	118-2
MS-5(C)	6	EDIT EN	111-14B 117-22B
WL-1	7	TC LAMP DRIVE	111-32B
WL-1	8	REG 5V	
CN147			
MF-1, 3	1	REG 12V	
MF-1, 3	2	GND	
LV-1	3	GND	
AO-2	4	REG -12V	
TR VR	5	TRACKING CONT	117-39B
TR VR	6	TRACKING 12V	117-40B
MS-5(C)	7	TBC EN	117-37A 112-8B 113-15A
WL-1	8	FRAMING EN	117-13A 143-1
MS-5(D)	9	DUB EN	114-27A
V METER	10	METER OUT (Y)	114-26A
V METER	11	METER OUT (X)	114-25A
LV-1	12	VIDEO LEVEL CONT	114

# FRAME (3) (MB-36) FRAME (3) (MB-36)

## 3 (BK-806:TC-20)

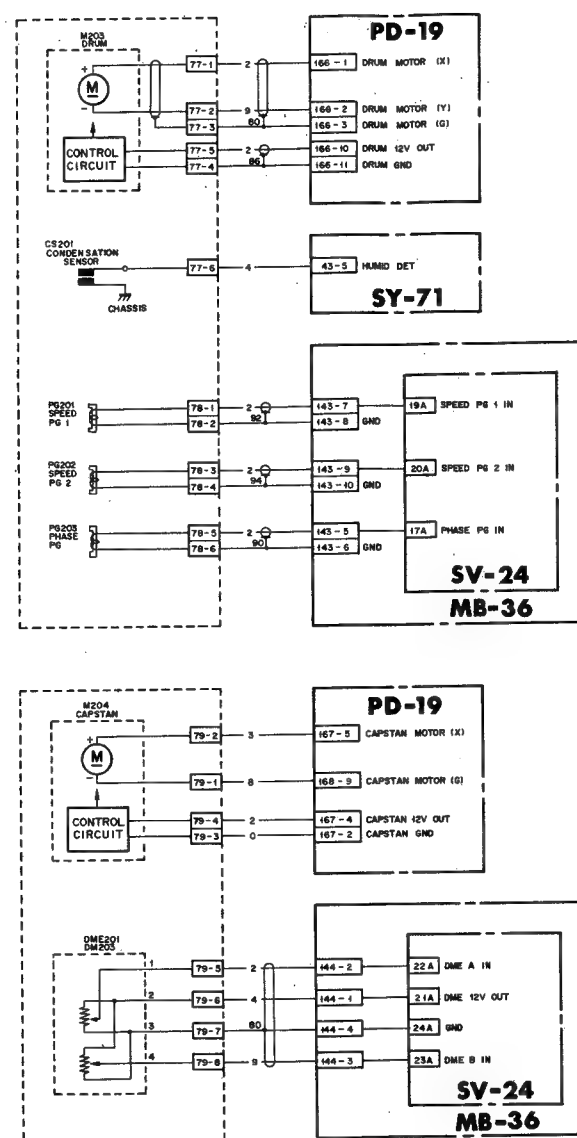
CN111	A	
1	GND	
2	REG 5V	
3	REG 12V	
4	+15V	
5	NC	
6	TC HEAD (X)	119-1
7	TC HEAD (Y)	119-2
8	TC HEAD (G)	119-3
9	NC	
10	H-TC	114-30B
11	H-LESS THAN L-2	142-31
12	NC	
13	VIDEO SYNC IN (X)	114-27B
14	VIDEO SYNC IN (G)	114-28B
15	NC	
16	GND	
17	DATA 0	120-3
18	DATA 1	120-4
19	DATA 2	120-5
20	DATA 3	120-7
21	TC-ADD 0	120-8
22	TC-ADD 1	120-9
23	TC-ADD 2	121-1
24	TC-ADD 3	121-2
25	CMO/ DATA	121-3
26	STS/ DATA	121-5
27	WRITE(LATCH)	121-6
28	DO	121-7
29	D1	121-9
30	D2	121-10
31	D3	121-11
32	NC	
33	NC	
34	H-EXT SYNC OUT	111-38B 117-16B
35	VIDEO EE 12V IN	112-38A 151-3 113-38B
36	(D1 RESET)	142-39 142-40
37	L-STANDBY IN	142-2 117-18B
38	H-EIA	142-38 150-1
39	PLAY STS	148-2
40	INPUT VIDEO DET	117-4A
41	1/2 VO IN	142-37 117-19B
42	-12V	
43	GND	

## (YD-10)

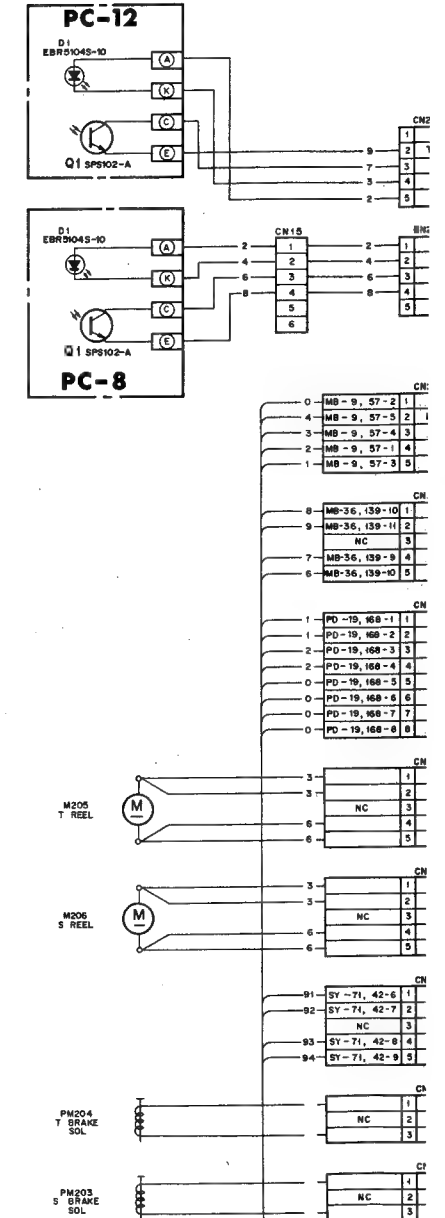
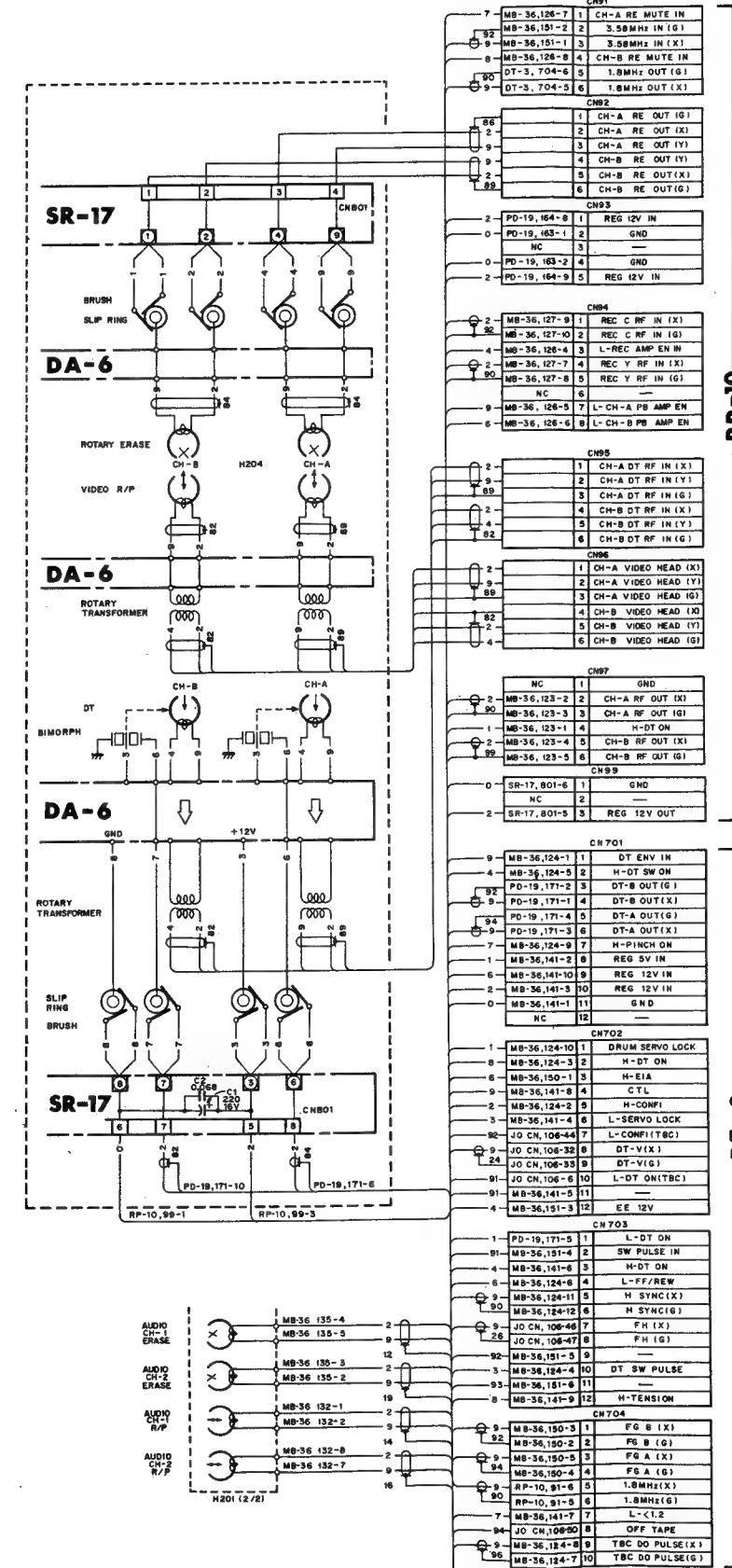
B		CN113		A	
	GND	1	GND		
	REG 5V	2	REG 5V		
	REG 12V	3	REG 12V		
	+15V	4	+15V		
123 - 2	PB RF IN CH - A (X)	5	EE Y RF IN (X)	114 - 11B	
123 - 3	PB RF IN CH - A (G)	6	EE Y RF IN (G)	114 - 12B	
123 - 4	PB RF IN CH - B (X)	7	EE C RF IN (X)	114 - 13B	
123 - 5	PB RF IN CH - B (G)	8	EE C RF IN (G)	114 - 14B	
112 - 9A	L - COLOR IN	9	PB RF OUT (X)	114 - 63B	
112 - 10A	C RF OUT (X)	10	PB RF OUT (G)	114 - 16B	
112 - 11A	C RF OUT (G)	11	TBC DO PULSE OUT (X)	112 - 34A	124 - 8
112 - 12A	TC MUTE IN	12	TBC DO PULSE OUT (G)	128 - 7	149 - 1
112 - 13A	DLO SW PULSE IN	13	Y DUB OUT (X)	128 - 1	149 - 3
112 - 14A	---	14	Y DUB OUT (G)	128 - 2	
112 - 15A	L - FF/REW	15	L TBC EN IN	112 - 9B	147 - 7
112 - 16A	SYNC Y OUT (X)	16	---	NC	117 - 37A
112 - 17A	SYNC Y OUT (G)	17	G BAND PULSE OUT	112 - 18A	
123 - 1	H - DT SW ON	18	---	NC	
124 - 5	H - DT SW ON	19	---	NC	
112 - 28B	H - DT ON IN	20	---	NC	
124 - 2	H - CONF1 IN	21	---	NC	
NC	---	22	---	NC	
NC	---	23	---	NC	
NC	---	24	---	NC	
NC	---	25	---	NC	
NC	---	26	---	NC	
NC	---	27	---	NC	
NC	---	28	---	NC	
NC	---	29	---	NC	
NC	---	30	---	NC	
NC	---	31	L - SERVO LOCK IN	112 - 31A	
NC	---	32	---	NC	
NC	---	33	AUDIO REC 12V IN	112 - 46B	
NC	---	34	---	142 - 25	
NC	---	35	---	NC	
112 - 36A	DEM00 Y OUT (X)	36	---	NC	
112 - 37A	DEM00 Y OUT (G)	37	---	NC	
112 - 38A	EE 12V IN	38	EE 12V IN	NC	
112 - 39A	C ENVELOPE IN	39	---	NC	
NC	---	40	---	NC	
NC	---	41	---	NC	
REG - 12V	42	REG - 12V	43	GND	
GND	44	GND			

FRAME (4)

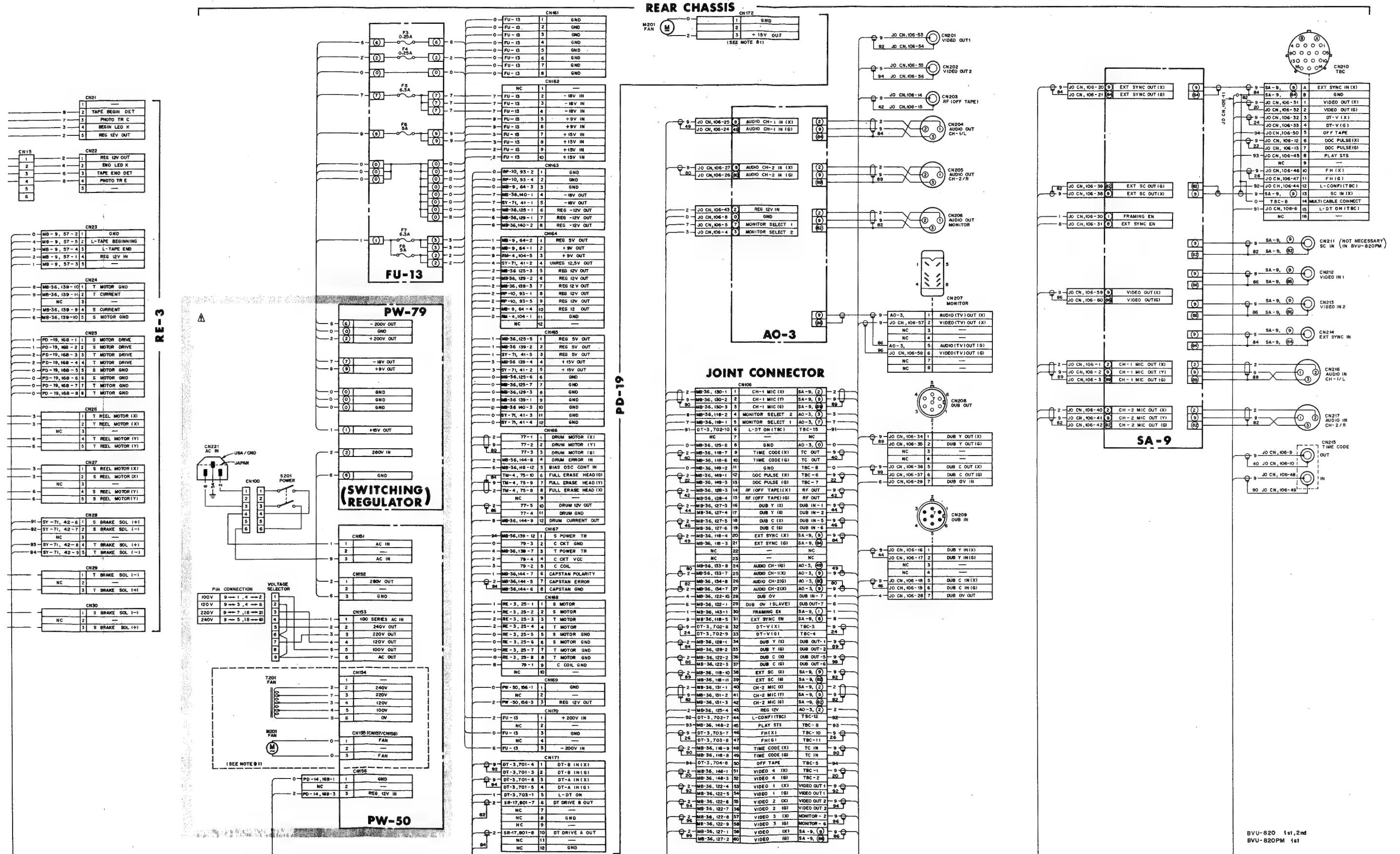
MARK	CHANGE INFORMATION	SERIAL NO.
PD-19	CH172 ADD	U/C: 10089~
PD-19	M201DC FAN MOTOR ADD	U/C: 11376~
T201	CH154	U/C: 10441~
PN-50	CH157/CH158	U/C: 10011~
DELETE		



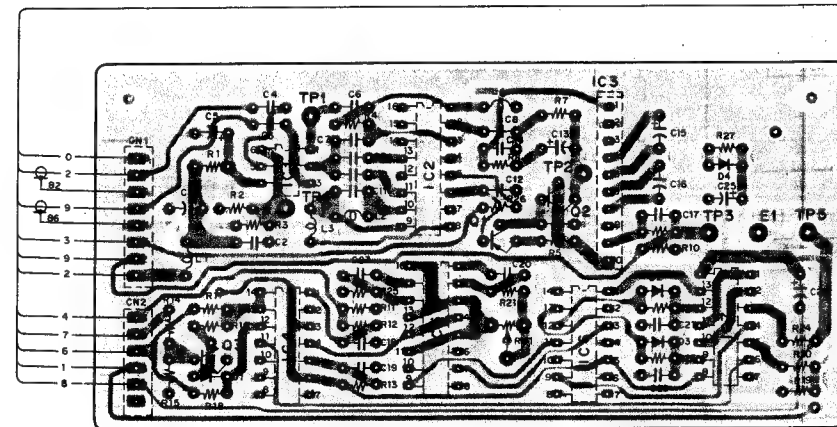
NOTE: C1, C2/SR-17 ARE DELETED  
S/N 10,021 AND HIGHER (J)  
S/N 10,031 AND HIGHER (U/C)  
S/N 10,001 AND HIGHER (PM)



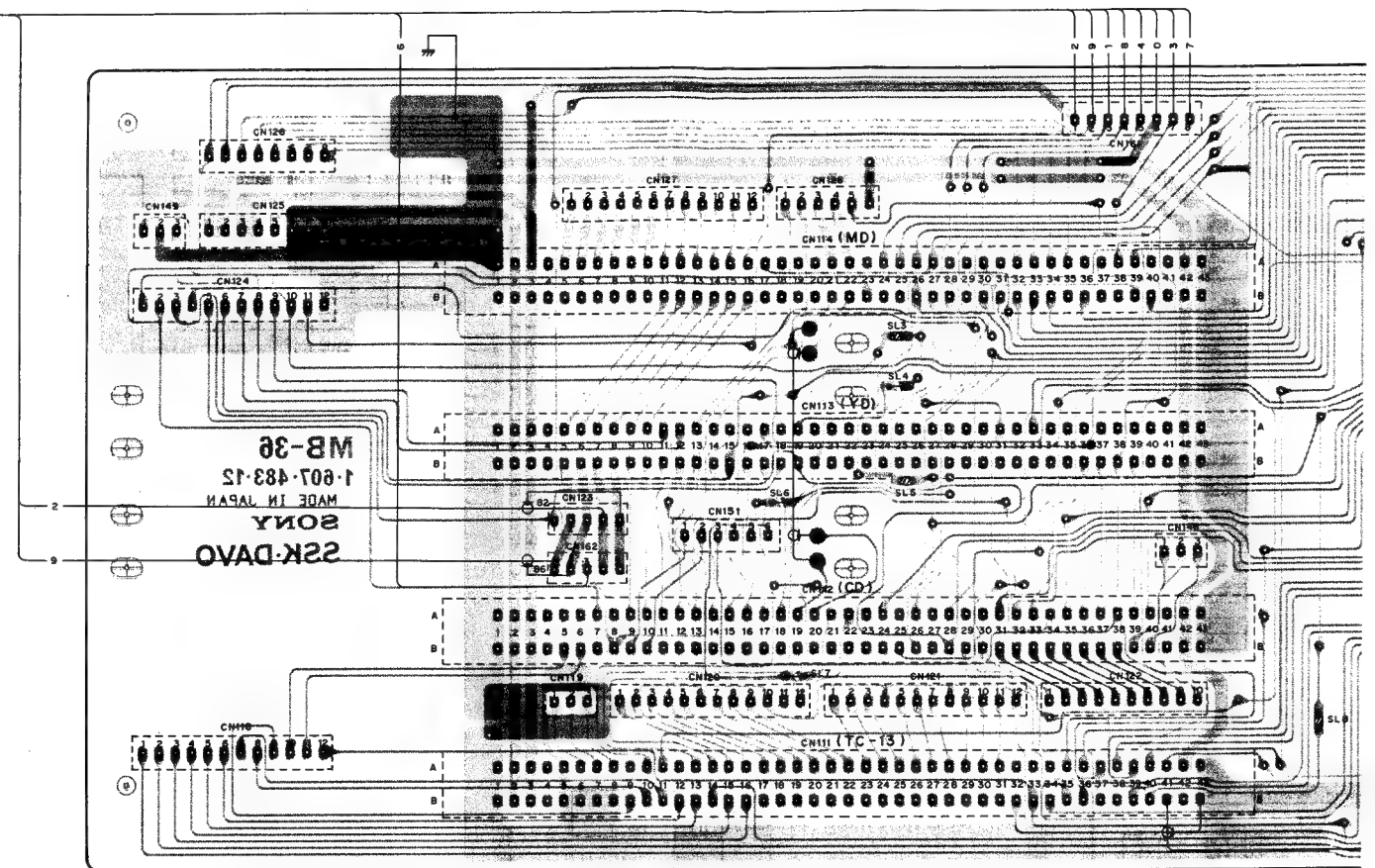
The shaded and -marked components are critical to safety.  
Replace only with same components as specified.



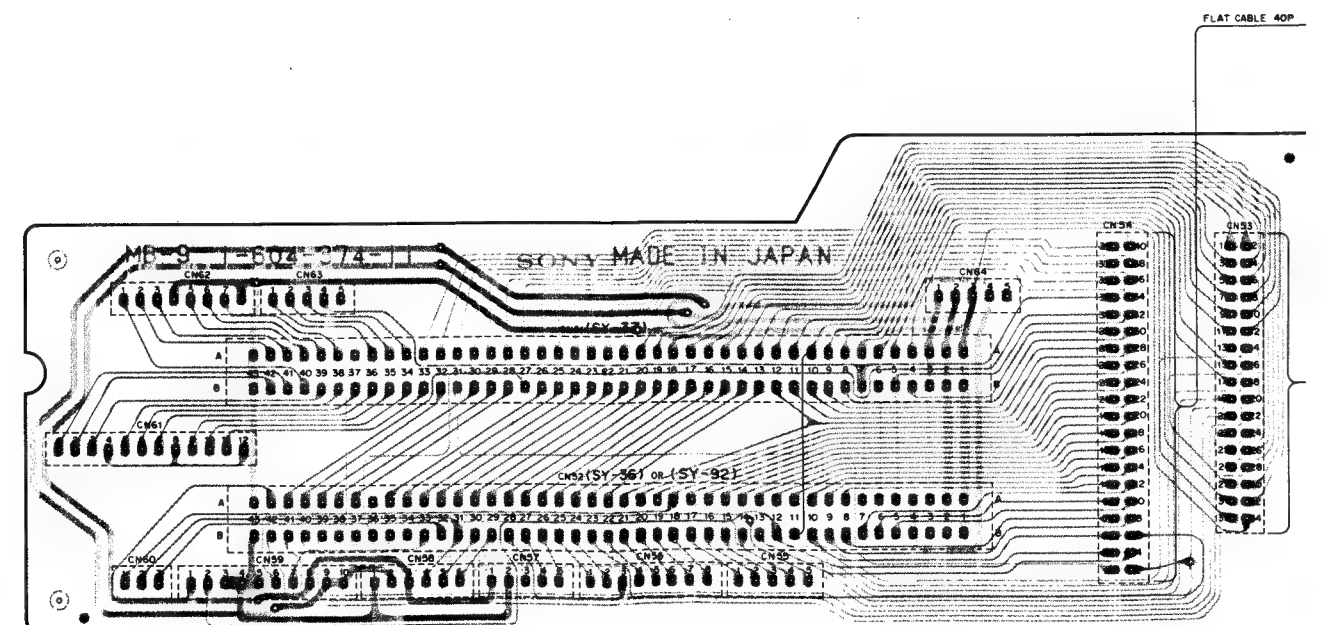




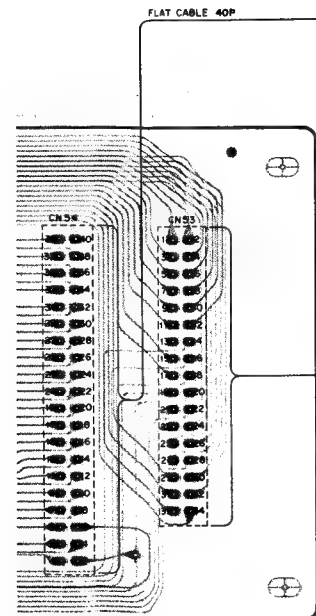
**FC-10—SOLDERING SIDE—**  
1-609-605-12  
(S/N. 10646~(U/C)  
(S/N. 10201~(J)  
(S/N. 10006~(PM)  
(S/N. 10301~(PAL)  
(S/N. 10051~(SECAM)



**MB-36**  
1-607-483-15  
MADE IN JAPAN  
SONY  
2SK-D4VO



**MB-9—SOLDERING SIDE—**  
1-604-374-11



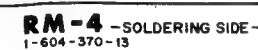
**NOTE:**

- SL = SLIT
- SL2, SL3, SL5, SL8  
(SHORT = NTSC/PM  
OPEN = PAL/SECAM)
- SL1, SL4, SL6, SL7, SL9  
(SHORT = PAL/SECAM  
OPEN = NTSC/PM)

BVU-820P(S/N.10501~)  
 BVU-820S(S/N.10051~)

BVU-820 (S/N.10746 ~ (U/C) )  
(S/N.10201 ~ (J) )  
BVU-820PM (S/N.10006 ~ )

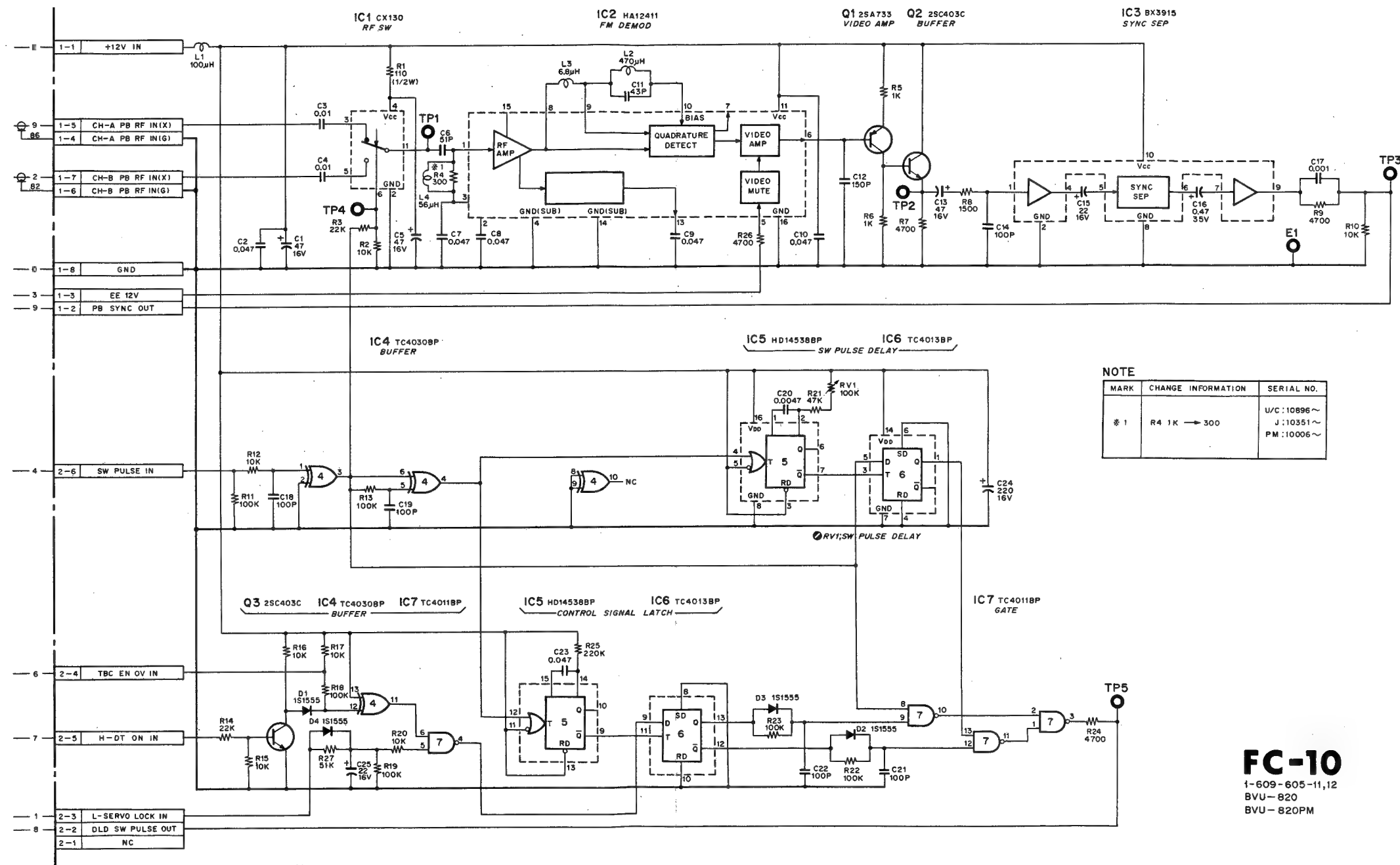
1-607-483-12



17-139

17-140

FC-10 (SWITCHING PULSE DELAY IN TBC AND DT)



NOTE		
MARK	CHANGE INFORMATION	SERIAL NO.
# 1	R4 1K → 300	U/C:10896~ J:10351~ PM:10006~

**FC-10**  
1-609-605-11,12  
BVU-820  
BVU-820PM





SECTION 18  
SPARE PARTS AND FIXTURE

18-1. PARTS INFORMATION

1. Safety Related Component Warning

Components identified by shading marked with **A** on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."

- This manual's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".
- Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. Printed Components in Bold-Face type on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

5. ( T ) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.  
(Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

18-2. EXPLODED VIEW

- Exploded views are composed of the following blocks.







- (1) Reel Chassis (1)
  - S, T reel table
  - S, T main brake
  - KCA/KCS detector
  - 6th guide.
- (2) Supply Tension Detector Block
  - Supply tension detector
  - Supply tension regulator arm
  - Tape end detector
- (3) Take-up Tension Detector Block
  - Take-up tension detector
  - Unthread end detector
  - Tape beginning detector

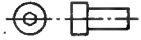
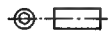
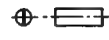
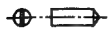
- (4) Threading Block
  - Threading ring
  - Threading slider
  - Thread end 2 detector
  - Ring drive gear
- (5) Threading Arm Block
  - Threading arm
  - Threading motor
  - Thread end 1 detector
  - V guide
- (6) Pinch Lever Block
  - Pinch solenoid
  - Pinch lever
- (7) Reel Chassis (bottom view)
  - S tension solenoid
  - S, T brake solenoid
  - Reel motor
- (8) Drum Block
  - Head drum
  - Slip-ring
  - Time code/erase head
  - Audio/CTL head
  - Capstan motor
- (9) Cassette-up Compartment Block
- (10) Control Panel Block
  - Control panel
  - Skew corrector
- (11) Function Control Panel Block
  - Function control panel
  - Key switch
  - Search dial
  - Hinge (R)
  - Hinge (L)
- (12) Power Chassis Block
- (13) Connector Panel Block (1)
- (14) Connector Panel Block (2)
  - Remote Connector
- (15) Chassis Block
  - Printed circuit board
- (16) Ornamental Panel Block (1)
- (17) Ornamental Panel Block (2)
  - Function control panel
  - Control panel
- (18) Printed Circuit Board
  - Shield case
- (19) Supplied Accessory

- Fixing Screw, Stop Ring and Others






- (1) All the screws used in this machine are the TOTSU type unless otherwise noted. The screws are interchangeable with the Phillips type ( ⊕ ) and slotted type ( ⊖ ) screws.
- (2) Please order as the following parts number when ordering the fixing screws, stop rings, and others.


SCREW

	PS	PSW	B (BZn N)	B (Cr-N)	PTT	PTTWH
						
2.6 x 4	7-621-972-05	—	7-621-912-10	7-621-912-18	—	—
2.6 x 6	7-621-972-25	7-621-981-15	7-621-912-30	7-621-912-38	—	—
2.6 x 8	7-621-972-35	7-621-981-25	7-621-912-40	7-621-912-48	—	—
3 x 5	7-686-446-01	—	—	—	—	—
3 x 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	7-687-414-31	7-687-513-31
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04	—	—
3 x 20	7-686-453-01	7-686-533-01	7-686-630-09	7-686-630-04	—	—
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04	—	—
4 x 8	7-686-468-01	7-686-548-01	7-686-635-09	7-686-635-04	—	—
4 x 12	7-686-470-01	7-686-550-01	7-686-637-09	7-686-637-04	—	—
4 x 14	7-686-471-01	—	7-686-638-09	7-686-638-04	—	—
4 x 16	7-686-472-01	—	7-686-639-09	7-686-639-04	—	—
4 x 20	7-686-473-01	—	7-686-640-09	7-686-640-04	—	—

	HEXAGON SOCKET SCREW	HEXAGON SET SCREW	(-) SET SCREW FLAT POINT	(-) SET SCREW CONE POINT
				
2.6 x 3	—	7-621-734-09	—	—
2.6 x 4	7-621-996-24	7-621-735-09	—	—
2.6 x 5	—	7-621-736-09	—	—
2.6 x 6	7-683-412-05	—	—	7-621-712-55
2.6 x 8	7-683-413-05	—	—	7-621-712-65
2.6 x 10	—	—	—	7-621-712-75
3 x 5	—	—	7-683-175-01	—
3 x 6	7-683-403-04	—	7-683-176-01	7-683-176-21
3 x 8	7-683-404-04	—	—	7-683-177-21
3 x 10	7-683-405-04	—	—	7-683-178-21

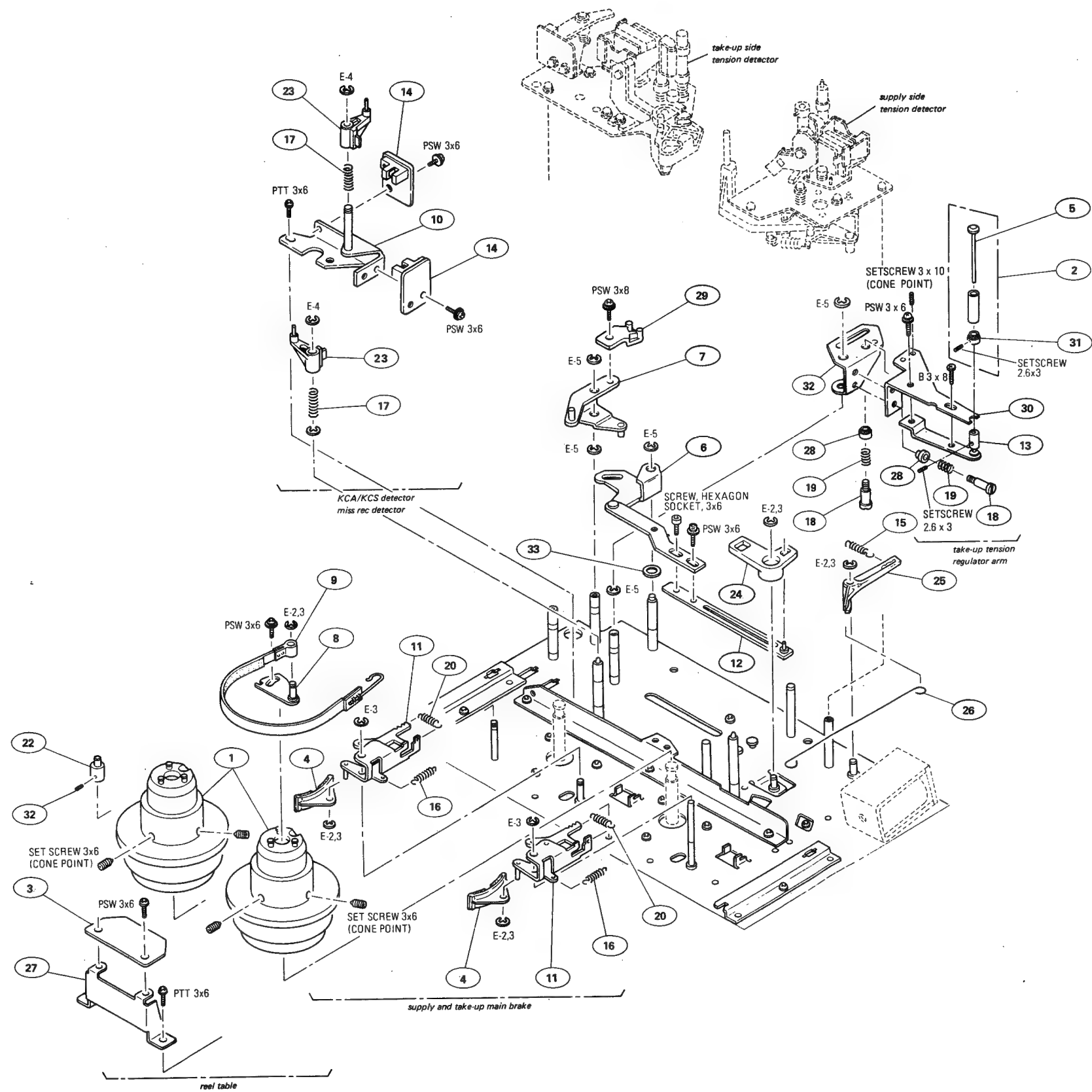
# WASHER

	FLAT WASHER SMALL W. 	FLAT WASHER MIDDLE W. 	SPRING WASHER SW. 	TOOTHED WASHER TYPE B LW. 	HEXAGON NUT N. 
2.6 mm	7-688-002-01	7-688-002-12	7-623-207-22	7-623-421-07	7-622-207-05
3 mm	7-688-003-01	7-688-003-12	7-688-003-11	7-623-422-07	7-684-023-04
4 mm	7-688-004-01	7-688-004-12	7-623-210-22	7-623-423-07	7-684-024-04
5 mm	7-688-005-01	7-688-005-01	7-623-212-22	—	7-684-025-04

	STOP RING E TYPE E. 
2	7-624-104-04
2.3	7-624-105-04
3	7-624-106-04
4	7-624-108-04
5	7-624-109-04
6	7-624-110-04


REEL CHASSIS (1) REEL CHASSIS (1)

Reel Chassis (1)



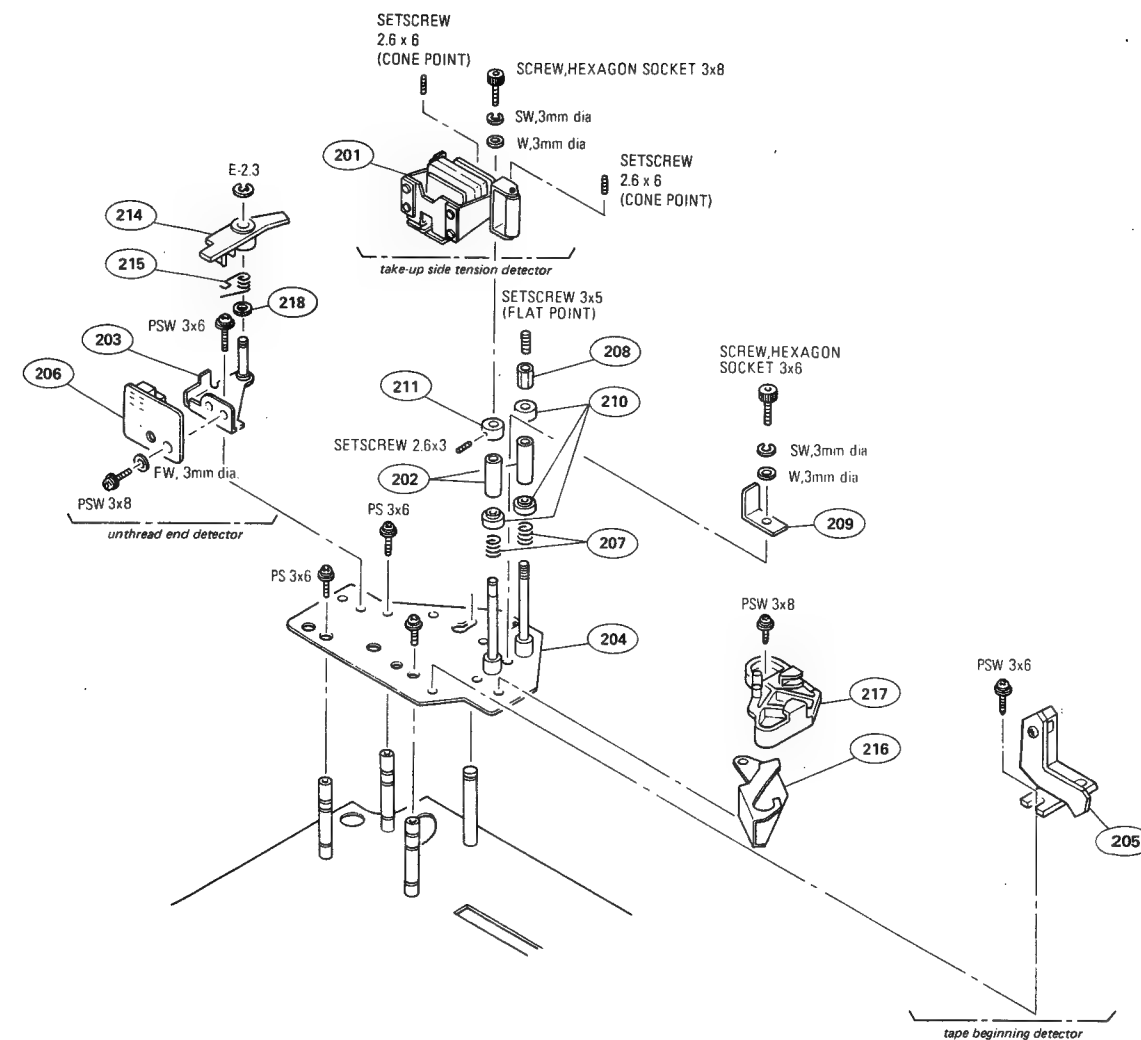
No.	Part No.	Description
1	<b>A-6739-015-B</b>	<b>TABLE ASSY, REEL</b>
2	<b>A-6746-017-A</b>	<b>ROLLER ASSY, 6G GUIDE</b>
3	<b>A-6748-123-B</b>	<b>PRINTED CIRCUIT BOARD, "EM-1"</b>
4	<b>X-3642-166-0</b>	<b>SHOE ASSY</b>
5	X-3668-001-0	GUIDE ASSY, 6G
6	X-3668-021-0	PLATE ASSY, ST
7	X-3668-025-0	ARM ASSY, DRAWER, 6T
8	X-3668-044-0	BRACKET SUB ASSY, TB
9	<b>X-3668-045-0</b>	<b>BAND ASSY, BRAKE</b>
10	X-3668-046-0	BRACKET SUB ASSY, S.D
11	X-3668-047-0	LEVER SUB ASSY, BRAKE
12	X-3668-050-0	PLATE ASSY, DRAWING
13	X-3668-084-0	PLATE ASSY, ADJUSTMENT, 6G
14	1-604-348-00	PRINTED CIRCUIT BOARD, PC-7
15	<b>3-446-195-00</b>	<b>SPRING, TENSION</b>
16	<b>3-535-558-00</b>	<b>SPRING, TENSION</b>
17	<b>3-543-967-00</b>	<b>SPRING, COMPRESSION</b>
18	3-641-621-00	SCREW, HEAD ADJUSTING
19	<b>3-641-622-00</b>	<b>SPRING, COMPRESSION</b>
20	3-642-752-00	SPRING, TENSION
22	3-668-031-00	RETAINER (UPPER), CASSETTE
23	<b>3-668-032-00</b>	<b>ACTUATOR, S.D</b>
24	3-668-033-00	ARM, DRAWER
25	<b>3-668-034-00</b>	<b>LEVER (1), S CHANGE</b>
26	3-668-036-00	ROD, PULL, S
27	3-668-037-02	BRACKET, R-DME
28	3-668-103-00	ROLLER, CAM
29	3-668-215-00	ARM (1), DRAWER, 6G
30	3-668-223-02	BASE, GUIDE, 6G
31	3-668-224-00	GUIDE (3) (LOWER), 6G
32	3-668-229-00	GUIDE (2), No. 6
33	<b>3-701-444-21</b>	<b>WASHER, POLY 6MM DIA. (0.5T)</b>
34	<b>3-701-506-01</b>	<b>SET SCREW, DOUBLE POINT 3x4</b>

NOTE:


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## TAKE-UP TENSION DETECTOR

### Take-up Tension Detector Block

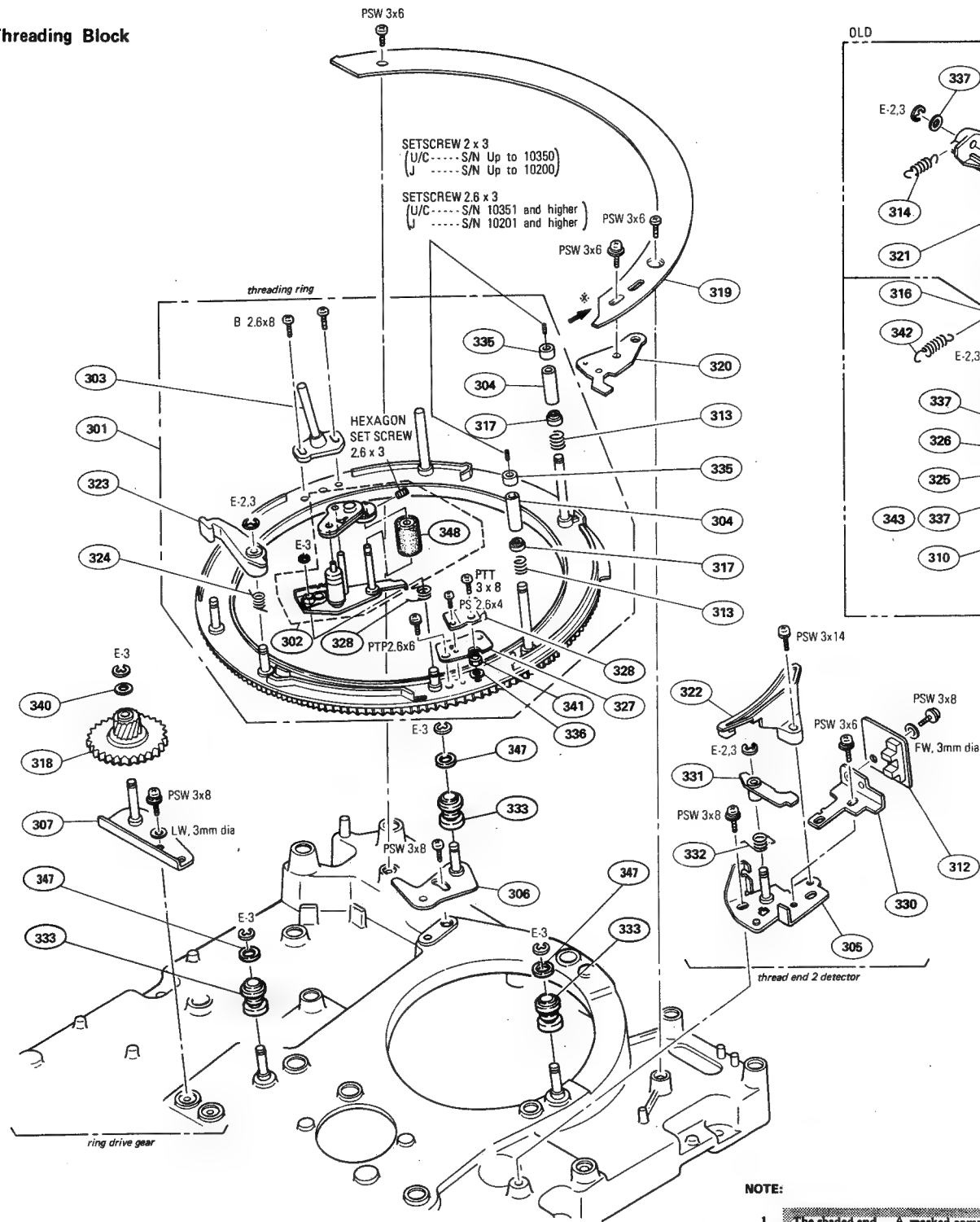


No.	Part No.	Description
<b>201</b>	<b>A-6742-034-A</b>	<b>DETECTOR (T) ASSY</b>
<b>202</b>	<b>X-3668-005-0</b>	<b>ROLLER ASSY (1), GUIDE</b>
203	X-3668-022-0	BASE ASSY, END, UT
204	X-3668-032-0	BASE SUB ASSY, T-TD
205	A-6742-047-A	PC-12 MOUNT
206	1-604-354-00	PRINTED CIRCUIT BOARD, EK-2
<b>207</b>	<b>3-537-213-00</b>	<b>SPRING, COMPRESSION</b>
<b>208</b>	<b>3-641-616-00</b>	<b>NUT, TAPE GUIDE ADJUSTMENT</b>
209	3-668-072-00	STOPPER, T.D
<b>210</b>	<b>3-668-073-00</b>	<b>FLANGE (1), G ROLLER</b>
<b>211</b>	<b>3-668-074-00</b>	<b>FLANGE (2), G ROLLER</b>
214	3-668-219-00	SENSOR, END, UT
215	3-668-220-00	SPRING
216	3-668-252-00	HOLDER, 5G
217	3-668-442-00	HOLDER (2), 5G
<b>218</b>	<b>3-701-439-11</b>	<b>WASHER, POLY, 3MM DIA. (0.25T)</b>

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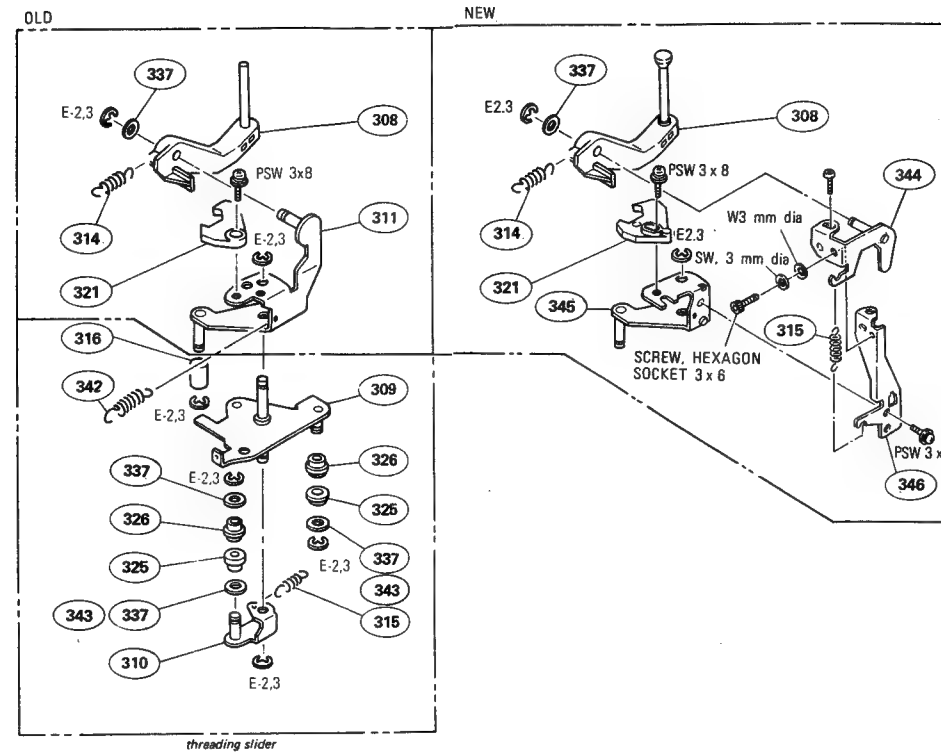
# THREADING      THREADING

## Threading Block



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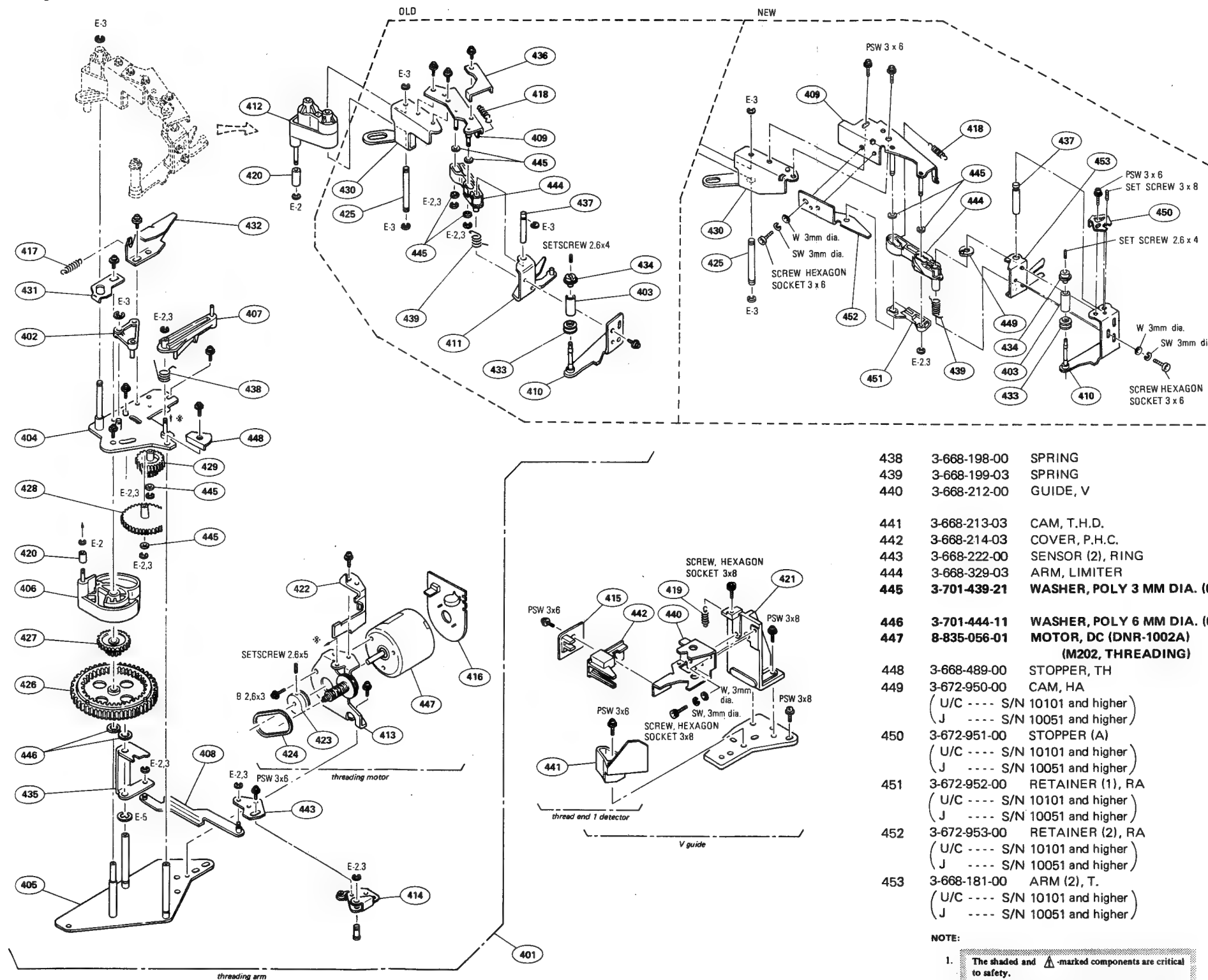


- |     |                                  |                               |
|-----|----------------------------------|-------------------------------|
| 331 | 3-668-283-00                     | SENSOR, END                   |
| 332 | 3-668-284-00                     | SPRING                        |
| 333 | 3-672-977-00                     | ROLLER, RING                  |
| 335 | 3-668-437-02                     | FLANGE (UPPER), ROLLER        |
|     | (U/C ----- S/N Up to 10350)      |                               |
|     | (J ----- S/N Up to 10200)        |                               |
|     | 3-668-437-03                     | FLANGE (UPPER), ROLLER        |
|     | (U/C ----- S/N 10351 and higher) |                               |
|     | (J ----- S/N 10201 and higher)   |                               |
| 336 | 3-672-910-00                     | WASHER, RUBBER                |
| 337 | 3-701-439-21                     | WASHER, POLY 3MM DIA. (0.5T)  |
| 340 | 3-701-441-21                     | WASHER, POLY 4MM DIA. (0.5T)  |
| 341 | 4-334-513-00                     | NUT, NYLON                    |
| 342 | 4-858-754-00                     | SPRING, TENSION               |
|     | (U/C ----- S/N Up to 10150)      |                               |
|     | (J ----- S/N Up to 10100)        |                               |
|     | 3-480-157-00                     | SPRING, TENSION               |
|     | (U/C ----- S/N 10151 and higher) |                               |
|     | (J ----- S/N 10101 and higher)   |                               |
| 343 | 3-701-439-11                     | WASHER, POLY 3MM DIA. (0.25T) |
|     | (U/C ----- S/N 10151 and higher) |                               |
|     | (J ----- S/N 10101 and higher)   |                               |
| 344 | X-3668-104-0                     | SUPPORT ASSY, ARM             |
|     | (U/C ----- S/N 10151 and higher) |                               |
|     | (J ----- S/N 10101 and higher)   |                               |
| 345 | X-3668-105-0                     | HOLDER (LOWER) ASSY, M        |
|     | (U/C ----- S/N 10151 and higher) |                               |
|     | (J ----- S/N 10101 and higher)   |                               |
| 346 | 3-672-963-00                     | HOLDER (UPPER), M             |
|     | (U/C ----- S/N 10151 and higher) |                               |
|     | (J ----- S/N 10101 and higher)   |                               |
| 347 | 3-701-441-01                     | WASHER, POLY 4MM DIA. (0.13T) |
|     | (U/C ----- S/N 10996 and higher) |                               |
|     | (J ----- S/N 10351 and higher)   |                               |
| 348 | X-3668-758-3                     | PINCH ROLLER ASSY             |

- | No. | Part No.                         | Description                    |
|-----|----------------------------------|--------------------------------|
| 301 | A-6750-112-G                     | RING ASSY, THREADING           |
| 302 | A-6750-113-F                     | ARM ASSY, PINCH                |
| 303 | X-3668-004-0                     | SPACER ASSY, GUIDE, CORRECTION |
| 304 | X-3668-005-0                     | ROLLER ASSY (1), GUIDE         |
| 305 | X-3668-009-0                     | CHASSIS ASSY, END              |
| 306 | X-3668-010-0                     | PLATE SUB ASSY, ADJUSTMENT     |
| 307 | X-3668-023-0                     | BASE ASSY, GEAR, RING          |
| 308 | X-3668-052-0                     | ARM ASSY, T.H.                 |
|     | (U/C ----- S/N Up to 10150)      |                                |
|     | (J ----- S/N Up to 10100)        |                                |
|     | X-3668-052-3                     | ARM ASSY, T.H.                 |
|     | (U/C ----- S/N 10151 and higher) |                                |
|     | (J ----- S/N 10101 and higher)   |                                |
| 309 | X-3668-053-0                     | BASE ASSY, M                   |
| 310 | X-3668-054-0                     | TABLE ASSY, ROLLER             |
| 311 | X-3668-063-0                     | HOLDER ASSY, M                 |
| 312 | 1-604-354-00                     | PRINTED CIRCUIT BOARD, EK-2    |
| 313 | 3-483-015-00                     | SPRING, COMPRESSION            |
| 314 | 3-549-810-00                     | SPRING, TENSION                |
|     | (U/C ----- S/N Up to 10150)      |                                |
|     | (J ----- S/N Up to 10100)        |                                |
|     | 4-858-754-00                     | SPRING, TENSION                |
|     | (U/C ----- S/N 10151 and higher) |                                |
|     | (J ----- S/N 10101 and higher)   |                                |
| 315 | 3-630-857-00                     | SPRING                         |
|     | (U/C ----- S/N Up to 10150)      |                                |
|     | (J ----- S/N Up to 10100)        |                                |
|     | 3-549-810-00                     | SPRING, TENSION                |
|     | (U/C ----- S/N 10151 and higher) |                                |
|     | (J ----- S/N 10101 and higher)   |                                |
| 316 | 3-642-410-00                     | ROLLER                         |
| 317 | 3-668-073-00                     | FLANGE (1), G ROLLER           |
| 318 | 3-668-210-00                     | GEAR (2), DRIVE, RING          |
| 319 | 3-668-234-00                     | RAIL (2)                       |
|     | (U/C ----- S/N Up to 10100)      |                                |
|     | (J ----- S/N Up to 10050)        |                                |
|     | 3-668-234-02                     | RAIL (2)                       |
|     | (U/C ----- S/N 10101 and higher) |                                |
|     | (J ----- S/N 10051 and higher)   |                                |
| 320 | 3-668-235-00                     | STOPPER, M                     |
| 321 | 3-668-245-00                     | PLATE (2), M-T.H               |
|     | (U/C ----- S/N Up to 10150)      |                                |
|     | (J ----- S/N Up to 10100)        |                                |
|     | 3-668-245-03                     | PLATE (2), M-T.H               |
|     | (U/C ----- S/N 10151 and higher) |                                |
|     | (J ----- S/N 10101 and higher)   |                                |
| 322 | 3-668-246-00                     | CAM, M RELEASE                 |
| 323 | 3-668-247-00                     | LEVER (3), RWD                 |
| 324 | 3-668-248-02                     | SPRING, TORSION                |
| 325 | 3-668-250-00                     | ROLLER (1), M                  |
| 326 | 3-668-251-00                     | ROLLER (2), M                  |
| 327 | 3-668-256-03                     | PLATE, BASE                    |
| 328 | 3-668-257-03                     | SPRING, LEAF                   |
| 329 | 3-668-261-00                     | SPRING, TORSION                |
| 330 | 3-668-282-00                     | BRACKET, PC                    |

# THREADING ARM      THREADING ARM

Threading Arm Block



438	3-668-198-00	SPRING
439	3-668-199-03	SPRING
440	3-668-212-00	GUIDE, V
441	3-668-213-03	CAM, T.H.D.
442	3-668-214-03	COVER, P.H.C.
443	3-668-222-00	SENSOR (2), RING
444	3-668-329-03	ARM, LIMITER
445	3-701-439-21	WASHER, POLY 3 MM DIA. (0.5T)
446	3-701-444-11	WASHER, POLY 6 MM DIA. (0.25T)
447	8-835-056-01	MOTOR, DC (DNR-1002A) (M202, THREADING)
448	3-668-489-00	STOPPER, TH
449	3-672-950-00	CAM, HA (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)
450	3-672-951-00	STOPPER (A) (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)
451	3-672-952-00	RETAINER (1), RA (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)
452	3-672-953-00	RETAINER (2), RA (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)
453	3-668-181-00	ARM (2), T. (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)

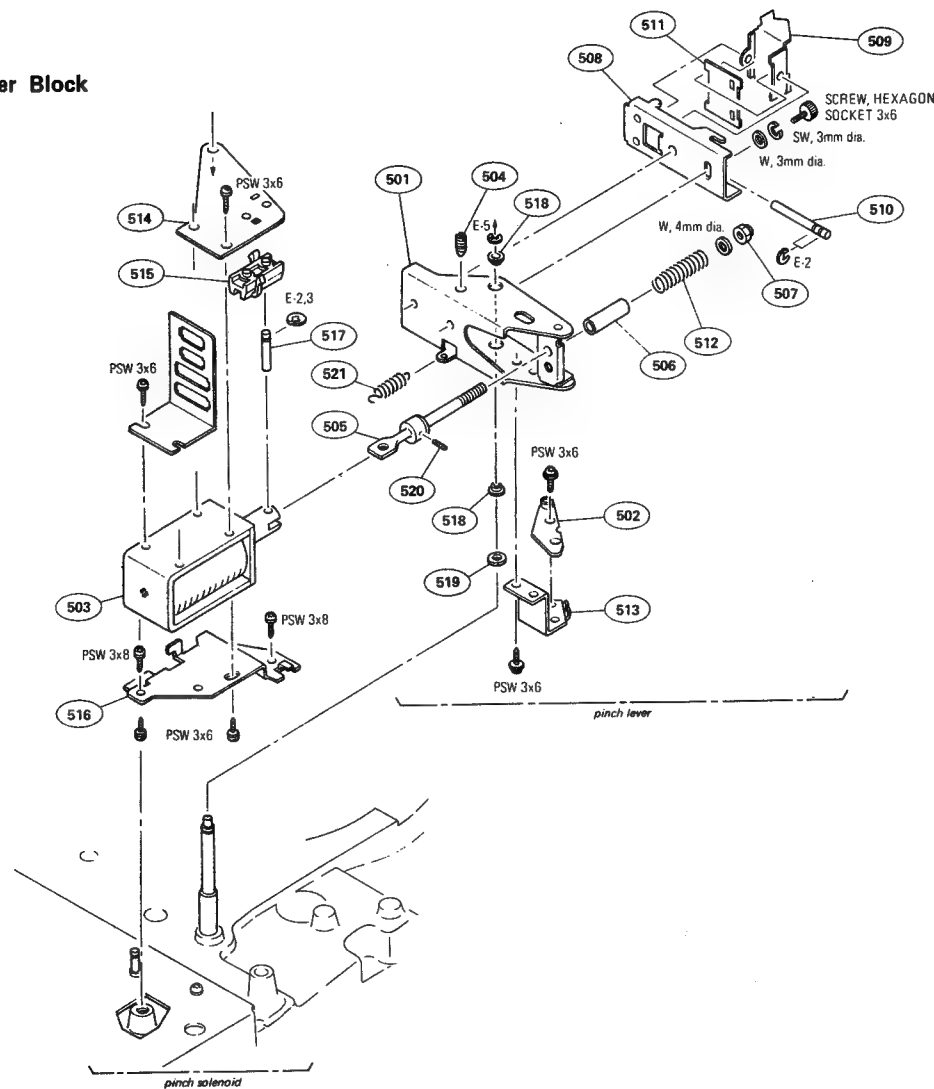
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No.	Parts No.	Description
401	A-6750-119-A	THREADING ASS'Y, T
402	X-3668-002-0	LEVER ASS'Y, R.C.
403	<b>X-3668-006-0</b>	<b>ROLLER ASS'Y (2), GUIDE</b>
404	X-3668-011-0	BASE (UPPER) ASS'Y, BLOCK, GEAR
405	X-3668-012-0	BASE (LOWER) ASS'Y, BLOCK, GEAR
406	<b>X-3668-013-0</b>	<b>CAM ASS'Y, M</b>
407	<b>X-3668-014-0</b>	<b>ARM ASS'Y, ROTARY</b>
408	X-3668-015-0	LEVER ASS'Y, RG
409	X-3668-016-0	ARM ASS'Y, THREADING (U/C ---- S/N UP TO 10100) (J ---- S/N UP TO 10050) X-3668-016-3 ARM ASS'Y, THREADING (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)
410	X-3668-017-0	ARM (1) ASS'Y, T. (U/C ---- S/N UP TO 10100) (J ---- S/N UP TO 10050) X-3668-017-3 ARM (1) ASS'Y, T. (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)
411	X-3668-018-0	ARM (2) ASS'Y, T. (U/C ---- S/N UP TO 10100) (J ---- S/N UP TO 10050)
412	X-3668-019-0	HOLDER ASS'Y, T.H.
413	<b>X-3668-020-0</b>	<b>BRACKET ASS'Y, MOTOR</b>
414	<b>X-3668-099-0</b>	<b>SENSOR ASS'Y, RING</b>
415	1-604-355-00	PRINTED CIRCUIT BOARD, "EK-3"
416	1-604-364-00	PRINTED CIRCUIT BOARD, "TM-8"
417	3-540-226-00	SPRING, TENSION
418	<b>3-486-135-XX</b>	<b>SPRING, TENSION (13T)</b>
419	<b>3-630-419-XX</b>	<b>SPRING, TENSION (16T)</b>
420	3-642-410-00	ROLLER
421	<b>3-642-474-00</b>	<b>BRACKET, ARM</b>
422	3-668-171-02	COVER, WORM
423	<b>3-668-172-00</b>	<b>PULLEY (3), LM</b>
424	<b>3-668-173-00</b>	<b>BELT (3), LM</b>
425	3-668-184-00	SHAFT, ARM, S
426	3-668-185-00	GEAR, RING
427	3-668-186-00	GEAR
428	3-668-187-00	GEAR, MIDWAY
429	3-668-188-00	WHEEL
430	3-668-190-03	ARM (1), THREADING
431	3-668-191-00	STOPPER, END, T.
432	3-668-192-04	CAM, UNTHREAD
433	<b>3-668-193-03</b>	<b>FLANGE (LOWER), GUIDE</b>
434	<b>3-668-194-02</b>	<b>FLANGE (UPPER), GUIDE</b>
435	3-668-195-00	STOPPER, U.T
436	3-668-196-00	STOPPER, ARM, T. (U/C ---- S/N UP TO 10100) (J ---- S/N UP TO 10050)
437	3-668-197-00	PIN, CENTER (U/C ---- S/N UP TO 10100) (J ---- S/N UP TO 10050) 3-668-197-02 PIN, CENTER (U/C ---- S/N 10101 and higher) (J ---- S/N 10051 and higher)

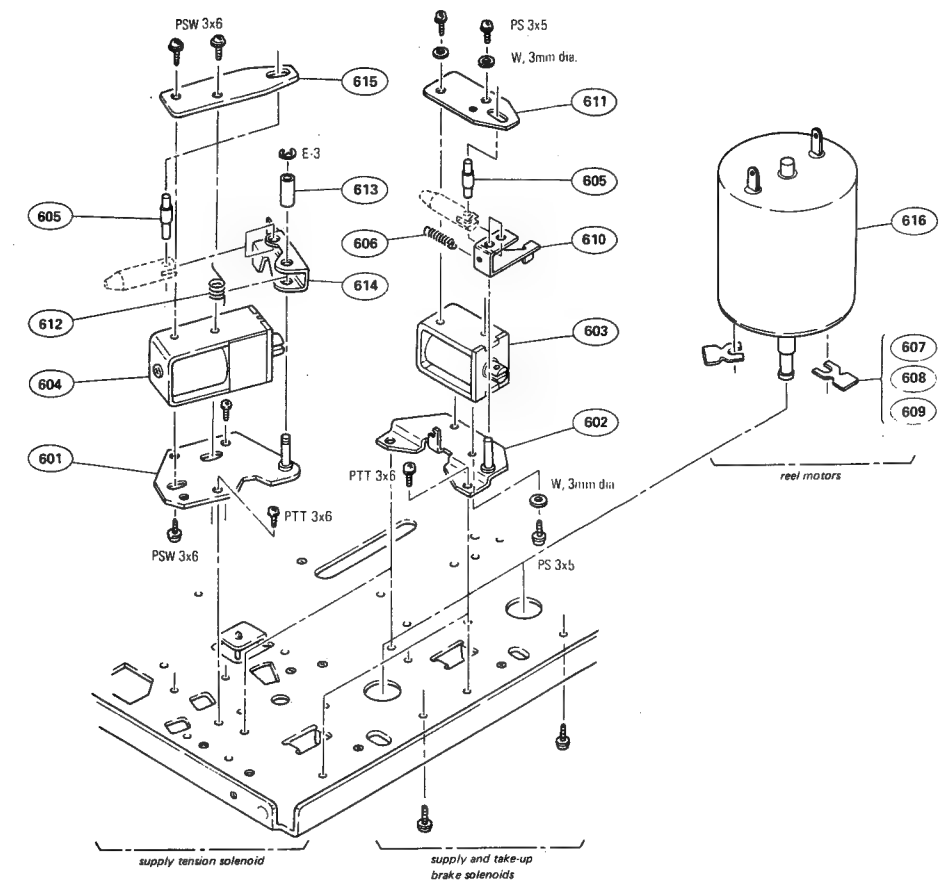
# PINCH LEVER REEL CHASSIS (BOTTOM VIEW)

Pinch Lever Block




No.	Part No.	Description	No.	Part No.	Description
501	X-3668-007-0	PINCH LEVER SUB ASSY	511	3-668-277-00	SPRING
502	X-3668-008-0	PLATE ASSY, ROLLER, CAM	512	3-668-278-00	SPRING, COMPRESSION
<b>503</b>	<b>1-454-276-00</b>	<b>SOLENOID (PINCH, PM205)</b>	513	3-668-279-00	BASE, CAM ROLLER
504	3-642-805-00	SCREW, ADJUSTING	514	3-668-289-00	REINFORCEMENT
505	3-648-054-00	ROD, PLUNGER JOINT	515	3-668-290-00	GUIDE, SHAFT
506	3-648-056-00	SPACER, 4x18	516	3-668-291-00	BRACKET, SOLENOID
507	3-648-057-00	NUT (ISO-4), U	517	3-668-292-00	SHAFT, SOLENOID
508	3-668-273-00	PINCH LEVER (B)	518	3-668-294-00	SPACER, PINCH
509	3-668-274-00	PINCH LEVER (C)	<b>519</b>	<b>3-701-444-11</b>	<b>WASHER, POLY 6MM DIA. (0.25T)</b>
510	3-668-276-00	SHAFT	520	3-701-508-00	SET SCREW, DOUBLE POINT 3x6
			<b>521</b>	<b>3-701-788-XX</b>	<b>SPRING, TENSION (48T)</b>

Reel Chassis (bottom view)



No.	Part No.	Description	No.	Part No.	Description
601	X-3668-048-0	BRACKET SUB ASSY, KS	611	3-668-044-00	GUIDE, BP
602	X-3668-049-0	BRACKET SUB ASSY, BP	612	3-668-047-00	SPRING
<b>603</b>	<b>1-454-278-00</b>	<b>SOLENOID (BRAKE, PM203, 204)</b>	613	3-668-048-01	SPACER (DIA. 4x12)
<b>604</b>	<b>1-454-279-00</b>	<b>SOLENOID (S.TENSION, PM201)</b>	614	3-668-049-00	LEVER, KS
605	3-645-051-03	PIN, D-PINCH PLUNGER	615	3-668-050-00	PLATE, GUIDE, KS
606	3-645-392-00	SPRING, TENSION	<b>616</b>	<b>8-835-050-01</b>	<b>MOTOR, DC (MNR-4400A)</b>
<b>607</b>	<b>3-651-334-01</b>	<b>SPACER, REEL MOTOR (0.02T)</b>			<b>(REEL, M206, 207)</b>
<b>608</b>	<b>3-651-334-11</b>	<b>SPACER, REEL MOTOR (0.05T)</b>			
<b>609</b>	<b>3-651-334-21</b>	<b>SPACER, REEL MOTOR (0.1T)</b>			
610	3-668-043-00	ARM, BP			

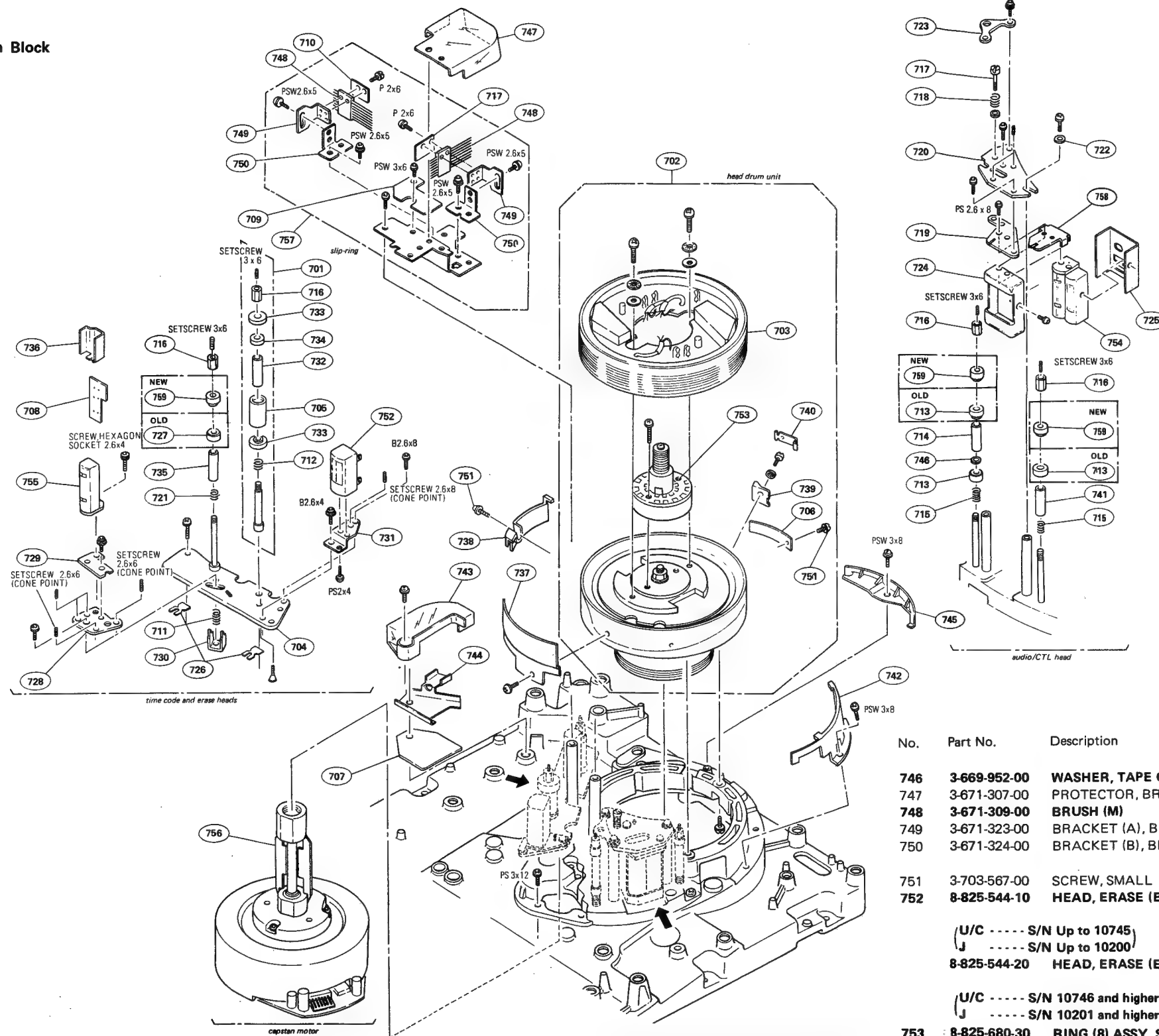
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# DRUM DRUM

## Drum Block



No.	Part No.	Description
746	3-669-952-00	WASHER, TAPE GUIDE
747	3-671-307-00	PROTECTOR, BRUSH
748	3-671-309-00	BRUSH (M)
749	3-671-323-00	BRACKET (A), BRUSH
750	3-671-324-00	BRACKET (B), BRUSH
751	3-703-567-00	SCREW, SMALL
752	8-825-544-10	HEAD, ERASE (EF232-58) (FULL ERASE, H203) (U/C ----- S/N Up to 10745) (J ----- S/N Up to 10200)
	8-825-544-20	HEAD, ERASE (EF248-58) (FULL ERASE, H203) (U/C ----- S/N 10746 and higher) (J ----- S/N 10201 and higher)
753	8-825-680-30	RING (8) ASSY, SLIP
754	8-829-358-35	HEAD AUDIO/CTL (EPP150-5803B)
755	8-829-371-11	HEAD, T/C (PP171-5802D)
756	8-838-019-01	MOTOR, DC (BHF-1600A)
757	A-6709-390-A	BRUSH (8) ASS'Y
758	3-669-985-00	PLATE, ADJUSTMENT (U/C ----- S/N 10746 and higher) (J ----- S/N 10201 and higher)
759	3-688-807-01	FRANG TAPE GUIDE (SERIAL No. [NOTE 5] and higher)

### NOTE:

4. U/C ..... # 11375  
J ..... # 10440  
PM ..... # 10020

5. U/C ..... # 11376  
J ..... # 10441  
PM ..... # 10021

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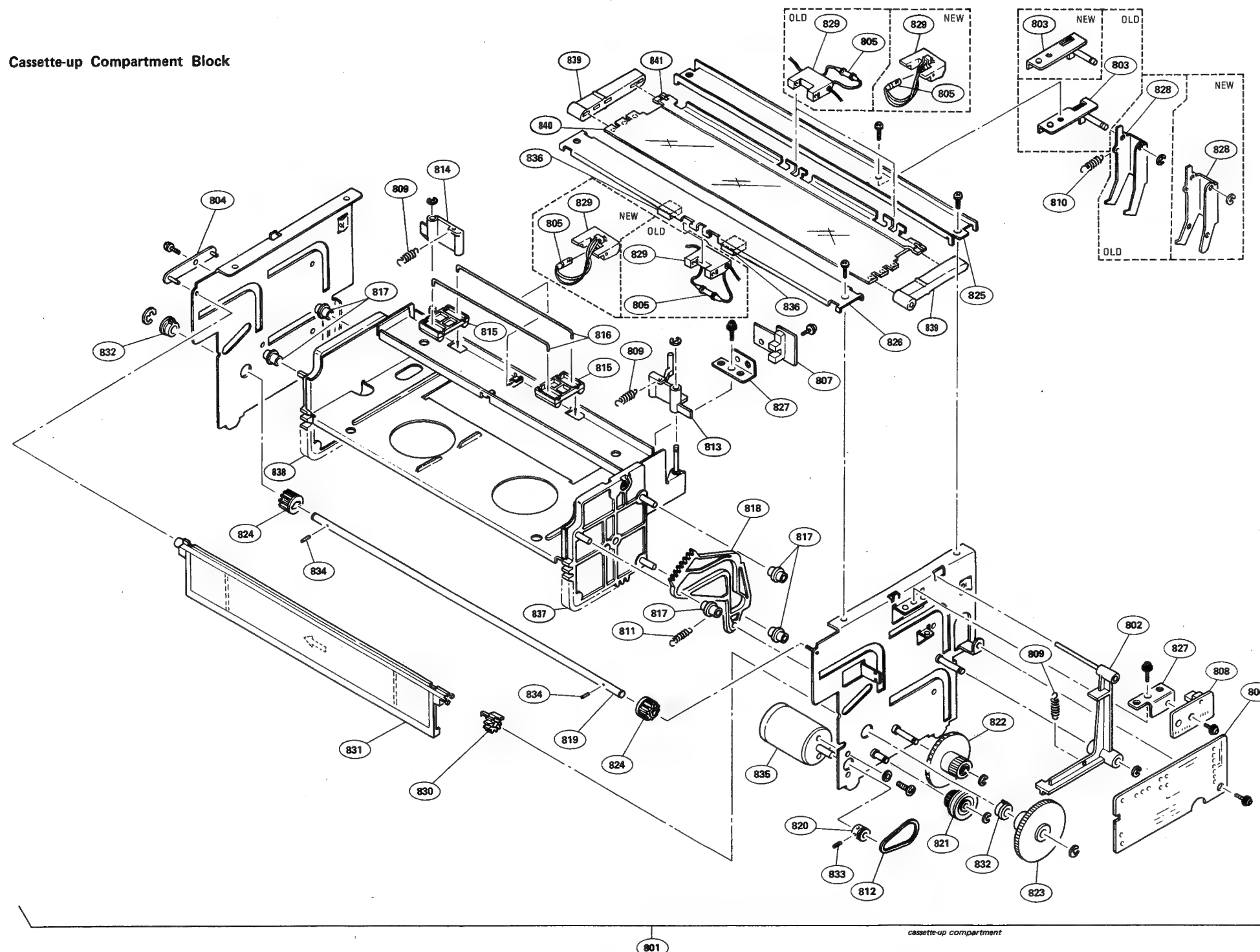
No.	Part No.	Description
701	A-6709-349-A	ROLLER GUIDE ASSY, D
702	A-6709-404-A	HEAD DRUM ASSY, DUH-25A-R
703	A-6709-406-A	UPPER DRUM ASSY, DUR-25-R
704	X-3655-606-0	BASE ASSY, GH (SERIAL NO. Up to [NOTE 4]) X-3655-606-03 BASE ASS'Y GH (SERIAL No. [NOTE 5] and higher)
705	X-3655-607-0	ROLLER ASSY, GUIDE
706	1-586-633-00	CONDENSATION, SENSOR
707	1-604-367-00	PRINTED CIRCUIT BOARD, TM-4
708	1-604-760-00	PRINTED CIRCUIT BOARD, TC-12
709	1-605-755-00	PRINTED CIRCUIT BOARD, SR-17
710	1-605-756-00	PRINTED CIRCUIT BOARD, DV-3
711	3-434-141-00	SPRING, COMPRESSION
712	3-537-214-00	SPRING (LOWER), COMPRESSION
713	3-641-612-00	GUIDE, TAPE
714	3-641-613-00	GUIDE, TAPE
715	3-641-615-00	SPRING, COMPRESSION
716	3-641-616-00	NUT, TAPE GUIDE ADJUSTMENT
717	3-641-621-00	SCREW, HEAD ADJUSTING
718	3-641-622-00	SPRING, COMPRESSION
719	3-641-640-00	BRACKET, (1) C.T.L. HEAD
720	3-641-641-02	BRACKET, (2) C.T.L. HEAD
721	3-644-718-00	SPRING, COMPRESSION (SERIAL No. Up to [NOTE 4]) 3-641-615-00 SPRING, COMPRESSION (SERIAL No. [NOTE 5] and higher)
722	3-645-076-00	WASHER, M-REEL S
723	3-647-815-00	PLATE, ADJUSTING, CTL HEAD
724	3-650-301-02	COVER, HEAD, D-CTL
725	3-650-302-00	COVER, HEAD, (REAR)
726	3-651-334-11	SPACER, REEL MOTOR (0.05T)
727	3-655-616-00	FLANGE (E.F), GUIDE (SERIAL No. Up to [NOTE 4])
728	3-655-618-00	BASE, TC
729	3-655-619-00	BRACKET, TC
730	3-655-620-00	SUPPORT, GUIDE
731	3-655-621-00	BRACKET, HEAD, E (U/C ----- S/N Up to 10745) (J ----- S/N Up to 10200) 3-655-652-00 BRACKET (2), E HEAD (U/C ----- S/N 10746 and higher) (J ----- S/N 10201 and higher)
732	3-655-625-00	SLEEVE, INNER
733	3-655-626-00	FLANGE
734	3-655-628-00	BEARING, BALL
735	3-655-630-00	GUIDE (E), TAPE (SERIAL No. Up to [NOTE 4]) 3-655-630-02 GUIDE (E), TAPE (SERIAL No. [NOTE 5] and higher)
736	3-655-638-00	SHIELD, TC HEAD
737	3-655-639-00	PLATE, SHIELD, TC
738	3-655-640-00	STOPPER, TAPE
739	3-656-501-00	HOLDER, TERMINAL
740	3-656-502-00	PLATE, TERMINAL
741	3-660-102-00	GUIDE, TAPE
742	3-668-293-00	GUARD, HEAD
743	3-668-441-00	COVER, HARNESS
744	3-668-462-00	HOLDER, TM-4
745	3-668-472-02	PROTECTOR (R)



## CASSETTE-UP COMPARTMENT

## CASSETTE-UP COMPARTMENT

Cassette-up Compartment Block



## NOTE:

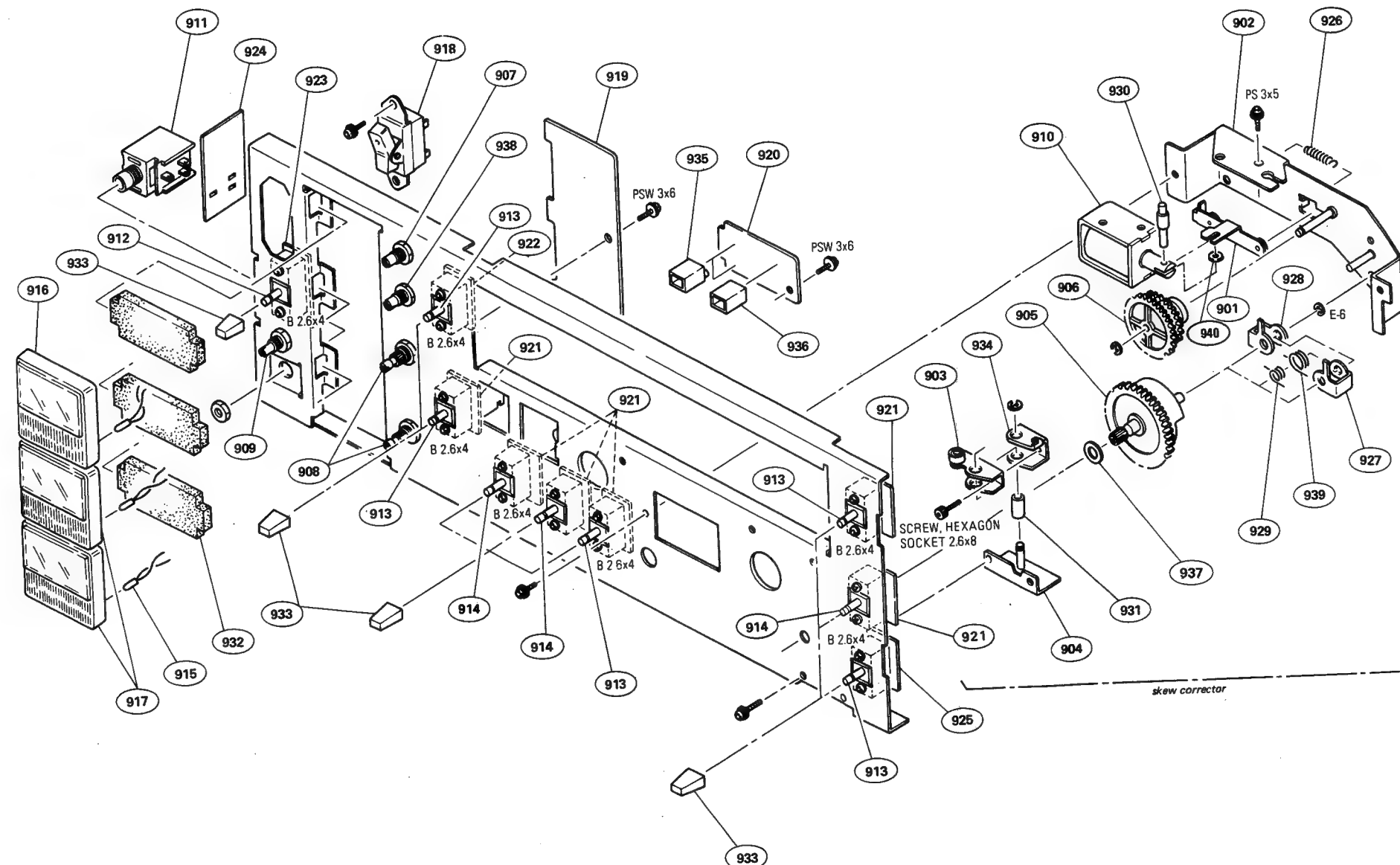
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3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

No.	Part No.	Description
833	<b>3-701-506-01</b>	<b>SET SCREW, DOUBLE POINT 3x4</b>
834	<b>3-703-358-00</b>	<b>PIN, PARALLEL (DIA. 2x8)</b>
835	<b>8-835-055-01</b>	<b>MOTOR, DC (DNR-4700A)</b> (CASSETTE, M207)
836	3-672-926-00	CUSHION, LID (U/C : UP TO S/N 10081 AND LATER) (J : S/N 10021 AND LATER)
837	<b>X-3668-057-0</b>	<b>CASECON ASSY, RACK (RIGHT)</b>
838	<b>X-3668-058-0</b>	<b>CASECON ASSY, RACK (LEFT)</b>
839	<b>3-668-313-02</b>	<b>FRAME, SUPPORT, REFLECTOR</b>
840	<b>3-672-604-11</b>	<b>REFLECTOR</b>
841	<b>3-672-639-03</b>	<b>BRACKET, LAMP</b>

No.	Part No.	Description
801	<b>A-6751-104-C</b>	<b>CASSETTE COMPARTMENT ASSY</b>
802	<b>X-3668-059-0</b>	<b>ARM ASSY, SWITCH, DOWN</b>
803	<b>X-3668-060-2</b>	<b>HOLDER ASSY, ARM</b> (U/C : UP TO S/N 10080) (J : UP TO S/N 10020)
	<b>X-3668-060-3</b>	<b>HOLDER ASSY, ARM</b> (U/C : S/N 10081 AND LATER) (J : S/N 10021 AND LATER)
804	<b>X-3668-061-0</b>	<b>SUPPORT ASSY, LID</b>
805	<b>1-518-455-00</b>	<b>LAMP, PILOT (PL207, 208, 209)</b> (U/C : UP TO S/N 10080) (J : UP TO S/N 10020)
	<b>1-518-508-00</b>	<b>LAMP, PILOT (PL207, 208, 209)</b> (U/C : S/N 10081 AND LATER) (J : S/N 10021 AND LATER)
806	1-604-429-00	PRINTED CIRCUIT BOARD, CC-9
807	1-604-430-00	PRINTED CIRCUIT BOARD, CC-10
808	1-604-431-00	PRINTED CIRCUIT BOARD, CC-11
809	3-507-051-00	SPRING, TENSION
810	<b>3-534-217-00</b>	<b>SPRING, TENSION</b>
811	<b>3-536-780-00</b>	<b>SPRING, TENSION</b>
812	<b>3-653-387-00</b>	<b>BELT, LM</b>
813	3-668-295-00	LEVER (RIGHT), CASSETTE PUSH-OUT
814	3-668-296-00	LEVER (LEFT), CASSETTE PUSH-OUT
815	<b>3-668-297-00</b>	<b>RETAINER, CASSETTE</b>
816	3-668-298-00	SPRING
817	<b>3-668-299-00</b>	<b>ROLLER, GUIDE</b>
818	3-668-300-00	CAM, LID OPEN
819	3-668-301-00	SHAFT, DRIVING
820	<b>3-668-302-00</b>	<b>PULLEY, MOTOR</b>
821	<b>3-668-303-00</b>	<b>GEAR (A)</b>
822	3-668-304-00	GEAR (B)
823	3-668-305-00	GEAR (C)
824	3-668-306-00	GEAR (D)
825	3-668-307-02	JOINT (R)
826	3-668-308-00	JOINT (F) (U/C : UP TO S/N 10080) (J : UP TO S/N 10020)
	3-668-308-03	JOINT (F) (U/C : S/N 10081 AND LATER) (J : S/N 10021 AND LATER)
827	3-668-309-00	BRACKET, SWITCH
828	3-668-310-00	ARM, LID OPEN (U/C : UP TO S/N 10080) (J : UP TO S/N 10020)
	3-668-310-02	ARM, LID OPEN (U/C : S/N 10081 AND LATER) (J : S/N 10021 AND LATER)
829	<b>3-668-314-00</b>	<b>HOLDER, LAMP</b> (U/C : UP TO S/N 10080) (J : UP TO S/N 10020)
	3-668-314-02	HOLDER, LAMP (U/C : S/N 10081 AND LATER) (J : S/N 10021 AND LATER)
830	<b>3-668-315-02</b>	<b>GEAR, LID</b>
831	<b>3-668-371-00</b>	<b>LID, CASSETTE</b>
832	<b>3-668-474-00</b>	<b>BEARING</b>

# CONTROL PANEL CONTROL PANEL

Control Panel Block



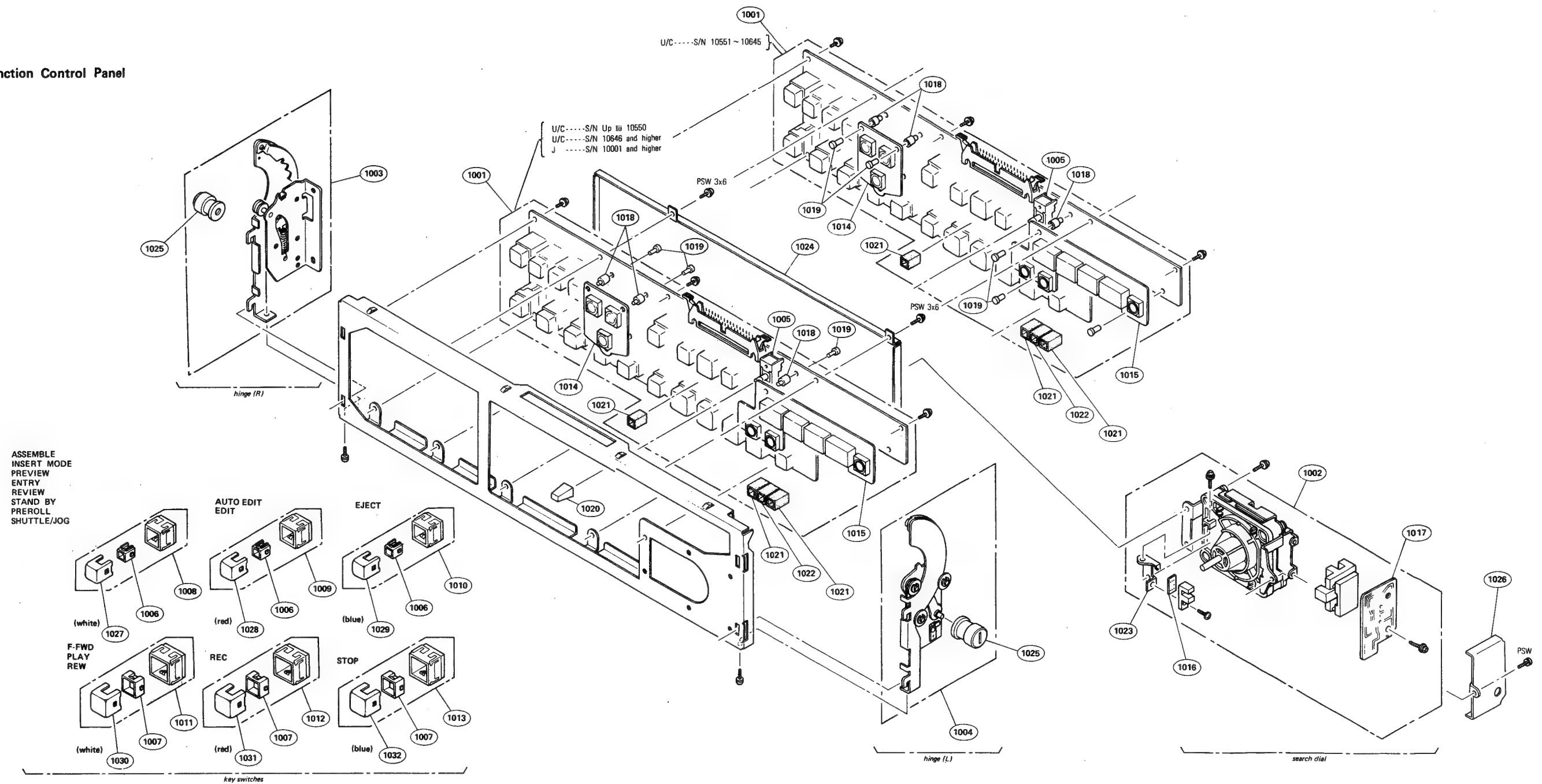
No.	Part No.	Description
901	X-3668-030-0	PLATE ASSY, LOCK, SK
902	X-3668-031-0	SUPPORT ASSY, SK
903	X-3668-033-0	LEVER (2) ASSY, S
904	X-3668-034-0	BRACKET ASSY, LEVER, S
905	X-3668-035-0	GEAR (3) ASSY, CLUTCH
906	<b>X-3668-036-0</b>	<b>CLUTCH ASSY, SK</b>
907	1-226-616-00	R, VAR, CARBON 100K
908	1-228-140-00	R, VAR, CARBON 20K/20K
909	1-228-218-00	R, VAR, CARBON 500/500 (RV1)
910	1-454-278-00	SOLENOID (SKEW, PM202)
911	1-507-553-00	JACK, JM-60 M-13S
912	1-516-963-00	SWITCH, LEVER SLIDE
913	1-516-994-00	SWITCH, LEVER SLIDE
914	1-516-995-00	SWITCH, LEVER SLIDE
915	1-518-461-00	LAMP, PILOT
916	1-520-438-00	METER, VIDEO (VIDEO/RF, ME201)
917	1-520-439-00	METER, VU (AUDIO CH-1: ME-202, AUDIO CH-2: ME203)
<b>918</b>	<b>1-553-159-00</b>	<b>SWITCH, ROCKER (POWER, S201)</b>
919	1-604-365-00	PRINTED CIRCUIT BOARD, MF-1
920	1-604-366-00	PRINTED CIRCUIT BOARD, WL-1
921	1-604-368-00	PRINTED CIRCUIT BOARD, MS-5
922	1-604-371-00	PRINTED CIRCUIT BOARD, LV-1
923	1-604-375-00	PRINTED CIRCUIT BOARD, AO-2
924	1-604-378-00	PRINTED CIRCUIT BOARD, HP-5
925	1-604-511-00	PRINTED CIRCUIT BOARD, PR-33
926	3-537-219-00	SPRING, TENSION
927	3-642-403-00	LEVER
928	3-642-404-00	LEVER
929	3-642-405-00	SPRING
930	3-645-051-03	PIN, D-PINCH PLUNGER
931	3-654-603-11	SPACER, 3x11
932	3-668-022-00	CUSHION, METER
933	3-668-028-00	KNOB (SMALL), LEVER SWITCH
934	3-668-111-00	LEVER (1), S
935	3-668-123-00	HOLDER, LAMP
936	3-668-124-00	HOLDER, LED
937	3-701-444-21	WASHER, POLY 6MM DIA. (0.5T)
938	1-224-691-XX	R, VAR, CARBON 10K
939	3-642-679-00	SPRING
940	3-701-443-21	WASHER, POLY 5MM DIA. (0.5T)

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# FUNCTION CONTROL      FUNCTION CONTROL

Function Control Panel



No.	Part No.	Description
1001	A-6717-205-A	MOUNTED CIRCUIT BOARD, KY-9
1002	A-6734-106-A	DIAL ASSY, SEARCH
1003	A-6736-030-A	HINGE (L) ASSY
1004	A-6736-031-A	HINGE (R) ASSY
1005	1-516-994-00	SWITCH, LEVER SLIDE
1006	1-518-450-31	LAMP, PILOT
1007	1-518-450-21	LAMP, PILOT
1008	1-554-318-11	SWITCH, KEY
1009	1-554-318-21	SWITCH, KEY
1010	1-554-318-31	SWITCH, KEY

No.	Part No.	Description
1011	1-553-551-12	SWITCH, KEY
1012	1-553-551-22	SWITCH, KEY
1013	1-553-551-32	SWITCH, KEY
1014	1-604-347-00	PRINTED CIRCUIT BOARD, KY-14
1015	1-604-349-00	PRINTED CIRCUIT BOARD, DP-9
1016	1-604-351-00	PRINTED CIRCUIT BOARD, PC-9
1017	1-604-353-00	PRINTED CIRCUIT BOARD, PC-14
1018	3-659-487-00	HOLDER, BUZER
1019	3-659-488-00	PIN, BUZER HOLDER
1020	3-668-028-00	KNOB (SMALL), LEVER SWITCH

No.	Part No.	Description
1021	3-668-123-00	HOLDER, LAMP
1022	3-668-124-00	HOLDER, LED
1023	3-668-151-00	BRACKET, PC14
1024	3-668-327-00	COVER, KEY PANEL
1025	3-668-407-00	NUT, LOCK
1026	3-668-417-00	COVER, PROTECTION, PC9
1027	3-706-480-01	KEY TOP (WHITE)
1028	3-706-480-12	KEY TOP (RED)
1029	3-706-480-22	KEY TOP (BLUE)
1030	3-706-481-01	KEY TOP (WHITE)

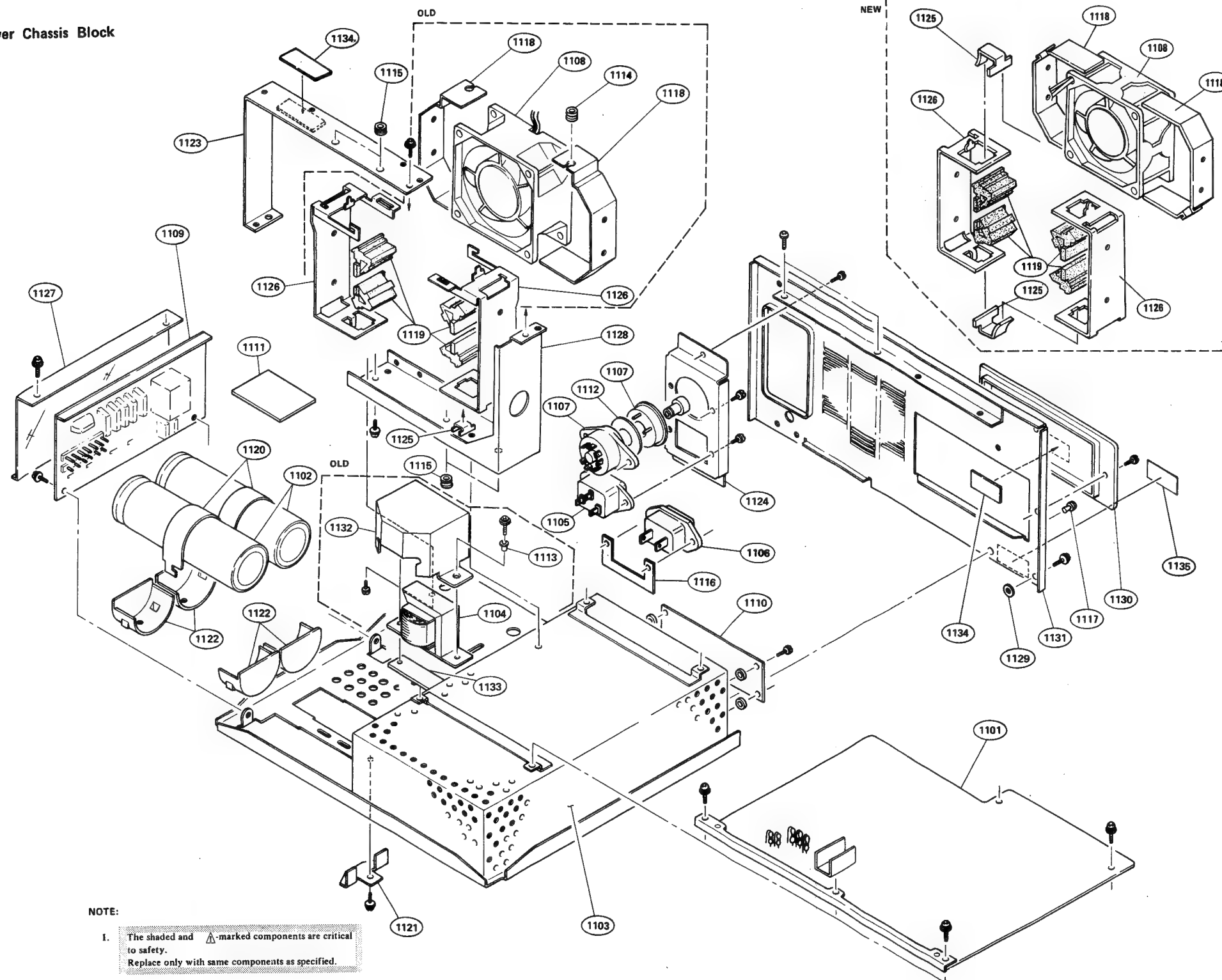
No.	Part No.	Description
1031	3-706-481-11	KEY TOP (RED)
1032	3-706-481-22	KEY TOP (BLUD)

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# POWER CHASSIS POWER CHASSIS

## Power Chassis Block



### NOTE:

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- U/C ..... # 11375  
J ..... # 10440  
PM ..... # 10010
- U/C ..... # 11376  
J ..... # 10441  
PM ..... # 10011

No.	Part No.	Description
1131	3-668-422-00	PANEL, PS
1132	3-668-477-00	SHIELD, AUTO TRANSFORMER (SERIAL No. up to <b>NOTE 4</b> )
1133	3-668-479-00	INSULATOR, BRACKET (SERIAL No. up to <b>NOTE 4</b> )
1134	3-703-044-26	LABEL, CAUTION
1135	3-703-845-01	LABEL (N), MAIN CAUTION

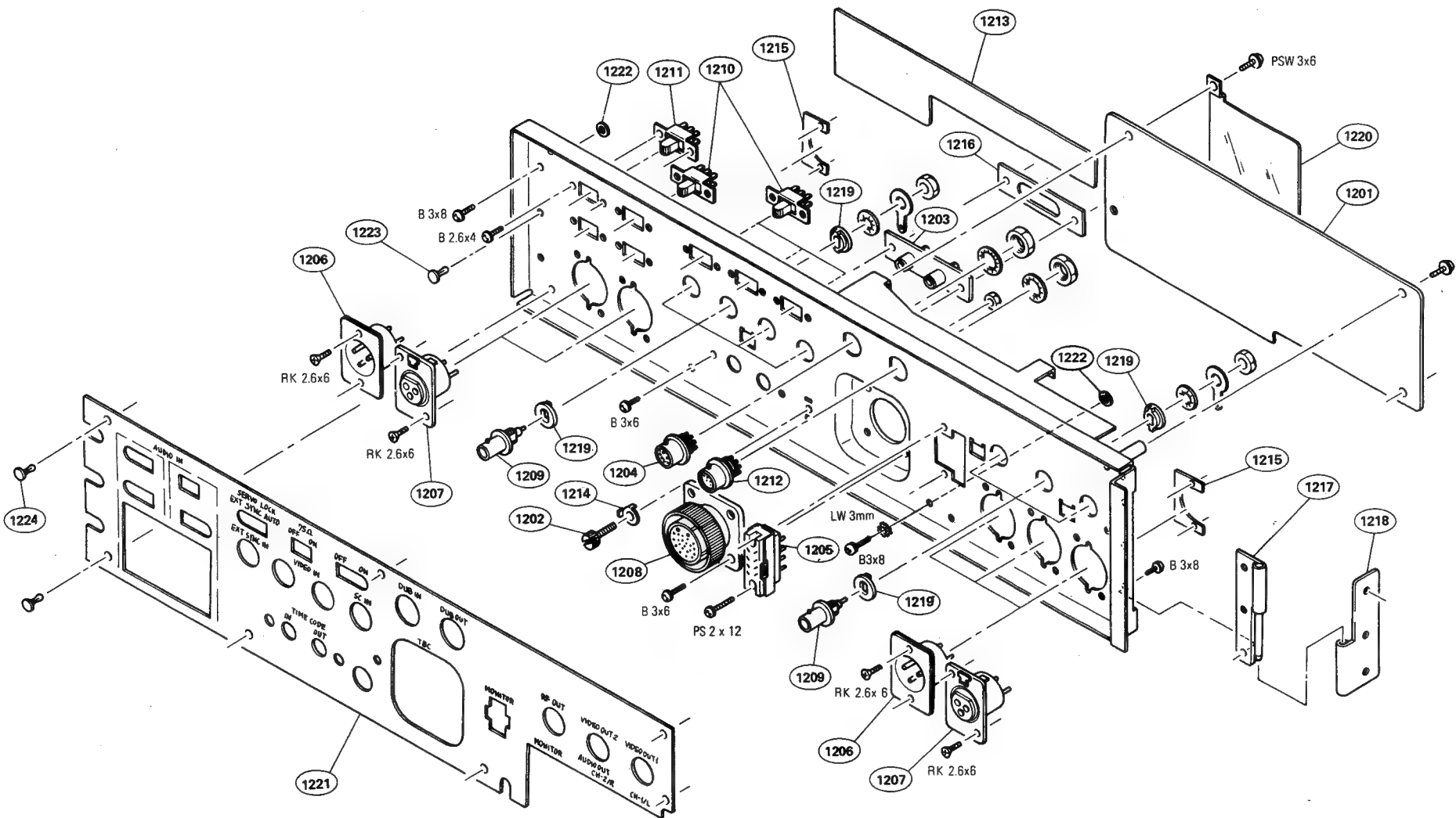
No.	Part No.	Description
1126	3-668-367-00	HOLDER, FAN (SERIAL No. up to <b>NOTE 4</b> )
	3-672-995-01	HOLDER, FAN (SERIAL No. <b>NOTE 5</b> and higher)
1127	3-668-369-00	PROTECTOR, PW
1128	3-668-370-00	FRAME (A), FAN
1129	3-668-413-00	WASHER (M3), STOP
1130	3-668-827-00	COVER, FUSE

No. Part No. Description

	1101	A-6723-174-A	MOUNTED CIRCUIT BOARD, PD-19
	1102	1-125-250-00	C, ELECT 3300MF
	1103	1-413-071-00	SWITCHING REGULATOR
	1104	1-446-938-00	TRANSFORMER (FAN, T201) (SERIAL No. Up to <b>NOTE 4</b> )
	1105	1-509-546-00	3P INLET (U/C MODEL) (AC IN, CN221)
	1106	1-509-801-00	AC INLET (J MODEL) (AC IN, CN221)
	1107	1-526-572-00	SOCKET, POWER VOLTAGE SELECT
	1108	1-541-104-00	BLOWER (FAN, M201) (U/C ..... S/N up to 10745) (J ..... S/N up to 10250)
	1108	1-541-104-51	BLOWER (FAN, M201) (U/C ..... S/N 10746 ~ 11375) (J ..... S/N 10251 ~ 10440) (PM ..... S/N 10001 ~ 10010)
	1108	1-541-264-11	BLOWER (FAN, M201) (SERIAL No. <b>NOTE 5</b> and higher)
	1109	1-604-363-00	PRINTED CIRCUIT BOARD, PW-50 (U/C ..... S/N up to 10745) (J ..... S/N up to 10250)
		1-604-363-16	PRINTED CIRCUIT BOARD, PW-50 (U/C ..... S/N 10746 ~ 11375) (J ..... S/N 10251 ~ 10440)
		1-604-363-17	PRINTED CIRCUIT BOARD, PW-50 (SERIAL No. <b>NOTE 5</b> and higher)
	1110	1-604-556-00	PRINTED CIRCUIT BOARD, FU-13
	1111	1-606-043-00	PRINTED CIRCUIT BOARD, RL-14
	1112	2-232-802-00	SEAL
	1113	2-832-002-00	BUSHING, INSULATING (SERIAL No. up to <b>NOTE 4</b> )
	1114	3-470-019-00	BUSING, RUBBER (SERIAL No. up to <b>NOTE 4</b> )
	1115	3-564-017-00	CUSHION, MOTOR
	1116	3-625-620-00	BRACKET, AC CONNECTOR (J MODEL)
	1117	3-646-090-11	RIVET, NYLON
	1118	3-650-271-00	PLATE, SHIELD, FAN (SERIAL No. up to <b>NOTE 4</b> )
		3-672-994-01	PLATE, SHIELD, FAN (SERIAL No. <b>NOTE 5</b> and higher)
	1119	3-650-272-00	ABSORBER, VIBRATION, FAN
	1120	3-668-154-00	BAND, C
	1121	3-668-155-00	RETAINER, C
	1122	3-668-157-00	RETAINER, C
	1123	3-668-158-00	FRAME (B), FAN
	1124	3-668-159-00	BRACKET, V.S
	1125	3-668-164-00	FASTENER, F

# CONNECTOR PANEL (1) CONNECTOR PANEL (1)

Connector Panel Block (1)



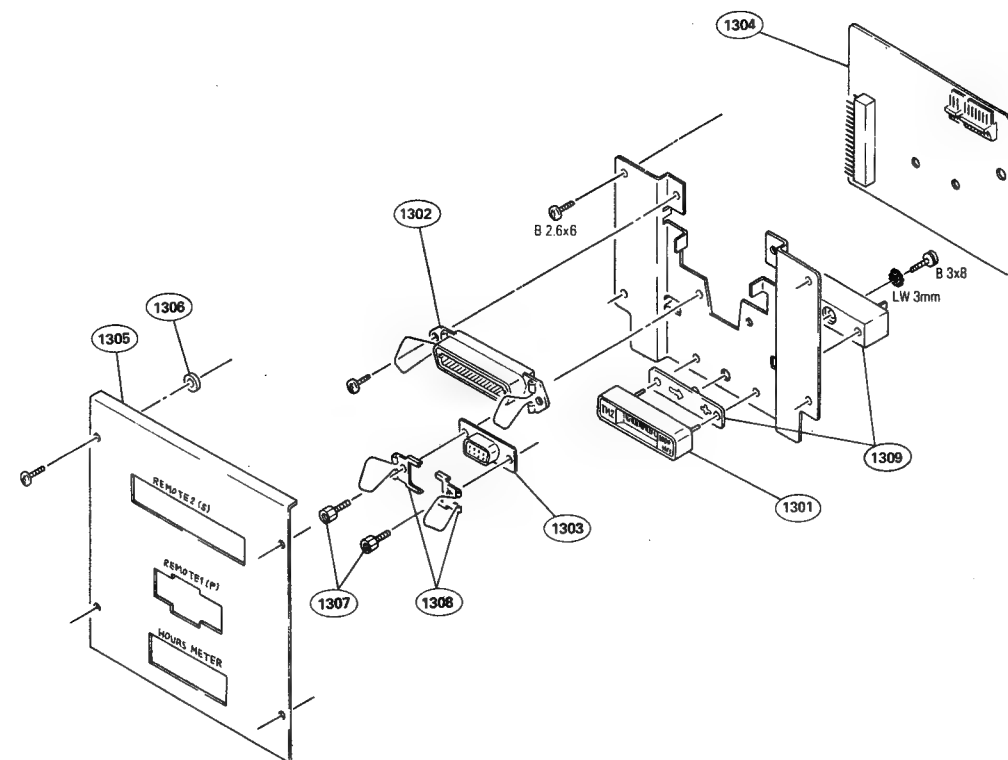
No.	Part No.	Description
1201	A-6713-106-A	MOUNTED CIRCUIT BOARD, AO-3
1202	X-2068-004-0	TERMINAL ASSY
1203	1-507-142-XX	2P PIN JACK (TIME CODE IN/OUT, CN215)
1204	1-508-945-00	RECEPTACLE, 7P (MALE) (DUE IN, CN209)
1205	1-509-095-00	8P MULTI SOCKET (MONITOR, CN207)
1206	1-509-176-00	RECEPTACLE, XLR, (MALE)
1207	1-509-184-00	RECEPTACLE, XLR, (FEMALE)
1208	1-509-471-00	RECEPTACLE, 18P, FEMALE (TBC, CN210)
1209	1-509-891-00	RECEPTACLE, BNC U/C ----- S/N Up to 11375 J ----- S/N Up to 10460 P ----- S/N Up to 11280 S ----- S/N Up to 10060 PM ----- S/N Up to 10020
	1-561-781-21	RECEPTACLE, BNC U/C ----- S/N 11376 and higher J ----- S/N 10461 and higher P ----- S/N 11281 and higher S ----- S/N 10061 and higher PM ----- S/N 10021 and higher
1210	1-516-777-XX	SLIDE SWITCH
1211	1-516-783-XX	SLIDE SWITCH
1212	1-561-045-00	RECEPTACLE, 7P (FEMALE) (DUB OUT, CN208)
1213	1-604-377-00	PRINTED CIRCUIT BOARD, SA-9
1214	2-068-008-00	WASHER
1215	2-232-914-00	PLATE NUT, XLR
1216	3-648-041-00	NUT, PLATE
1217	3-651-651-00	HINGE (A)
1218	3-651-652-00	HINGE (B)
1219	3-654-545-00	SPACER, BNC U/C ----- S/N Up to 11375 J ----- S/N Up to 10460 P ----- S/N Up to 11280 S ----- S/N Up to 10060 PM ----- S/N Up to 10020
1220	3-672-975-00	INSULATOR, AO-3
1221	3-668-381-00	PLATE, ORNAMENTAL, PANEL (FOR U/C, J, P, S)
1221	3-672-916-00	PLATE (PM), ORNAMENTAL, PANEL (FOR PM)
1222	3-668-413-00	WASHER (M3), STOP
1223	3-703-356-00	RIVET, T TYPE
1224	4-812-134-11	RIVET NYLON, 3.5

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# CONNECTOR PANEL (2) CHASSIS

Connector Panel Block (2)

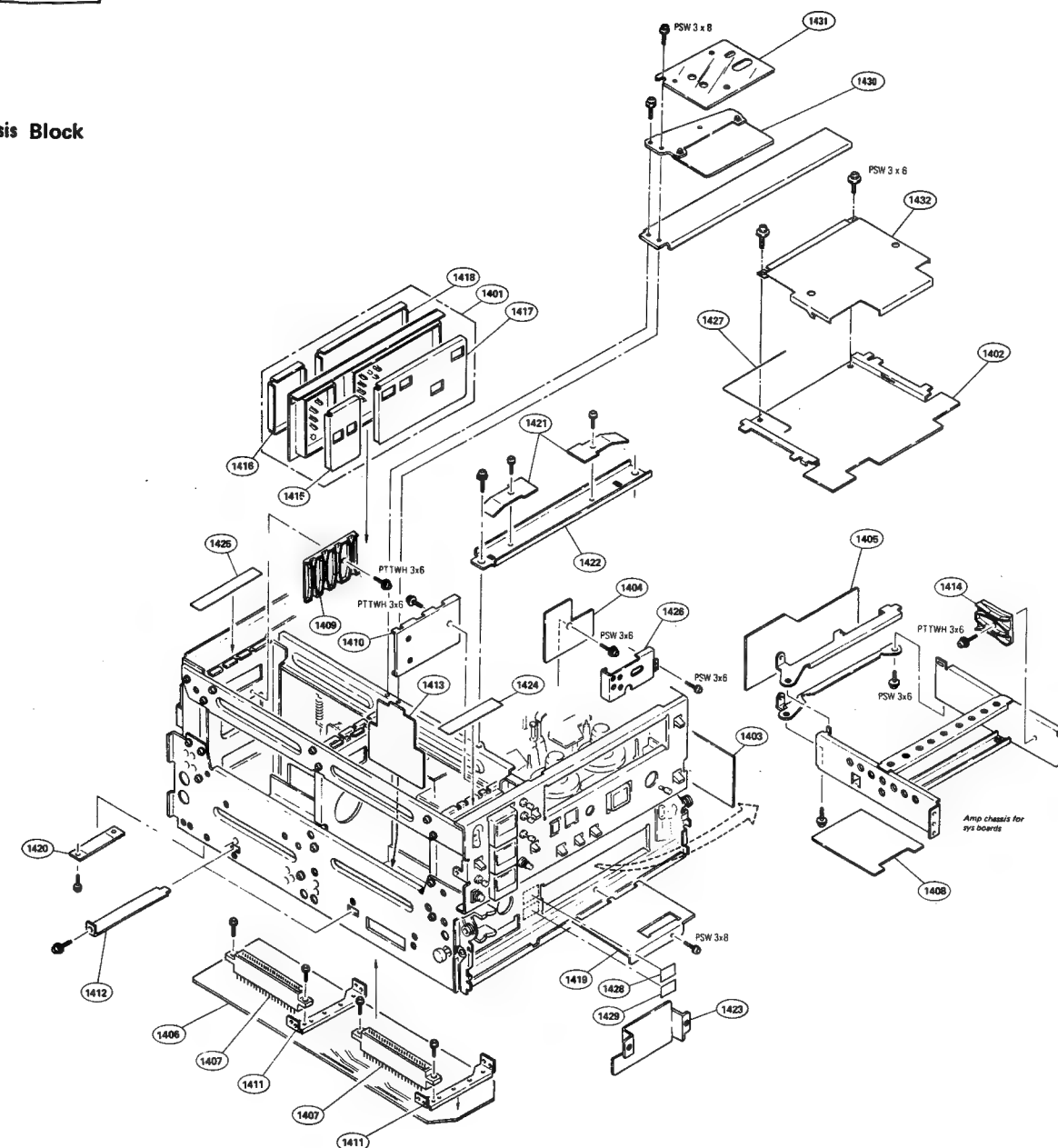


No.	Part No.	Description
1301	1-548-141-41	TIMER (HOURS METER, TM201)
1302	1-561-028-00	CONNECTOR, 36P (REMOTE 2, CN101)
1303	1-561-655-00	CONNECTOR, 9P (REMOTE 1, CN102)
1304	1-604-370-00	PRINTED CIRCUIT BOARD, RM-4
1305	3-668-343-00	PANEL (RIGHT LOWER), CONNECTOR
1306	3-668-413-00	WASHER (M3), STOP
1307	3-668-459-00	SCREW, CONNECTOR
1308	3-668-460-00	SPRING
1309	1-526-829-31	TIMER SOCKET

NOTE:

- The shaded and marked components are critical to safety. Replace only with same component as specified.
- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

Chassis Block



No.	Part No.	Description
1401	A-6711-367-A	MOUNTED CIRCUIT BOARD, RP-10
1402	A-6715-163-A	MOUNTED CIRCUIT BOARD, DT-3
1403	A-6717-208-A	MOUNTED CIRCUIT BOARD, SY-71
1404	A-6725-227-B	MOUNTED CIRCUIT BOARD, RE-3
1405	A-6728-238-A	MOUNTED CIRCUIT BOARD, MB-9
1406	A-6728-481-B	MOUNTED CIRCUIT BOARD, MB-36
1407	1-561-654-00	CONNECTOR, CARD 86P
1408	3-668-119-00	PROTECTOR, MB-9
1409	3-668-129-02	GUIDE (3), PC BOARD
1410	3-668-130-00	GUIDE (4), PC BOARD
1411	3-668-131-02	BRACKET (A), CN
1412	3-668-132-00	BRACKET (B), CN
1413	3-668-133-00	PROTECTOR, MB-8
1414	3-668-134-00	GUIDE (2), PC BOARD
1415	3-668-138-00	COVER, UPPER, SHIELD CASE (A)

No.	Part No.	Description
1416	3-668-139-00	COVER, LOWER, SHIELD CASE (A)
1417	3-668-361-00	COVER, UPPER, SHIELD CASE (B)
1418	3-668-362-00	COVER, LOWER, SHIELD CASE (B)
1419	3-668-423-00	RETAINER (FRONT), FC
1420	3-668-424-00	RETAINER (REAR), FC
1421	3-668-425-00	SPRING
1422	3-668-426-00	STAY, CASSETTE COMPARTMENT
1423	3-668-433-02	COVER, FRONT
1424	3-668-438-00	LABEL (1), PC BOARD
1425	3-668-439-00	LABEL (2), PC BOARD
1426	3-668-440-00	PROTECTOR, RE
1427	3-668-481-00	HOOK, DT PC BOARD
1428	3-668-485-00	LABEL (3), PC BOARD
1429	3-668-486-00	LEBEL (4), PC BOARD
1430	A-6711-423-A	MOUNTED CIRCUIT BOARD, FC-10
1431	3-672-970-00	COVER, FC-10
1432	3-672-974-00	PLATE (B), BLIND

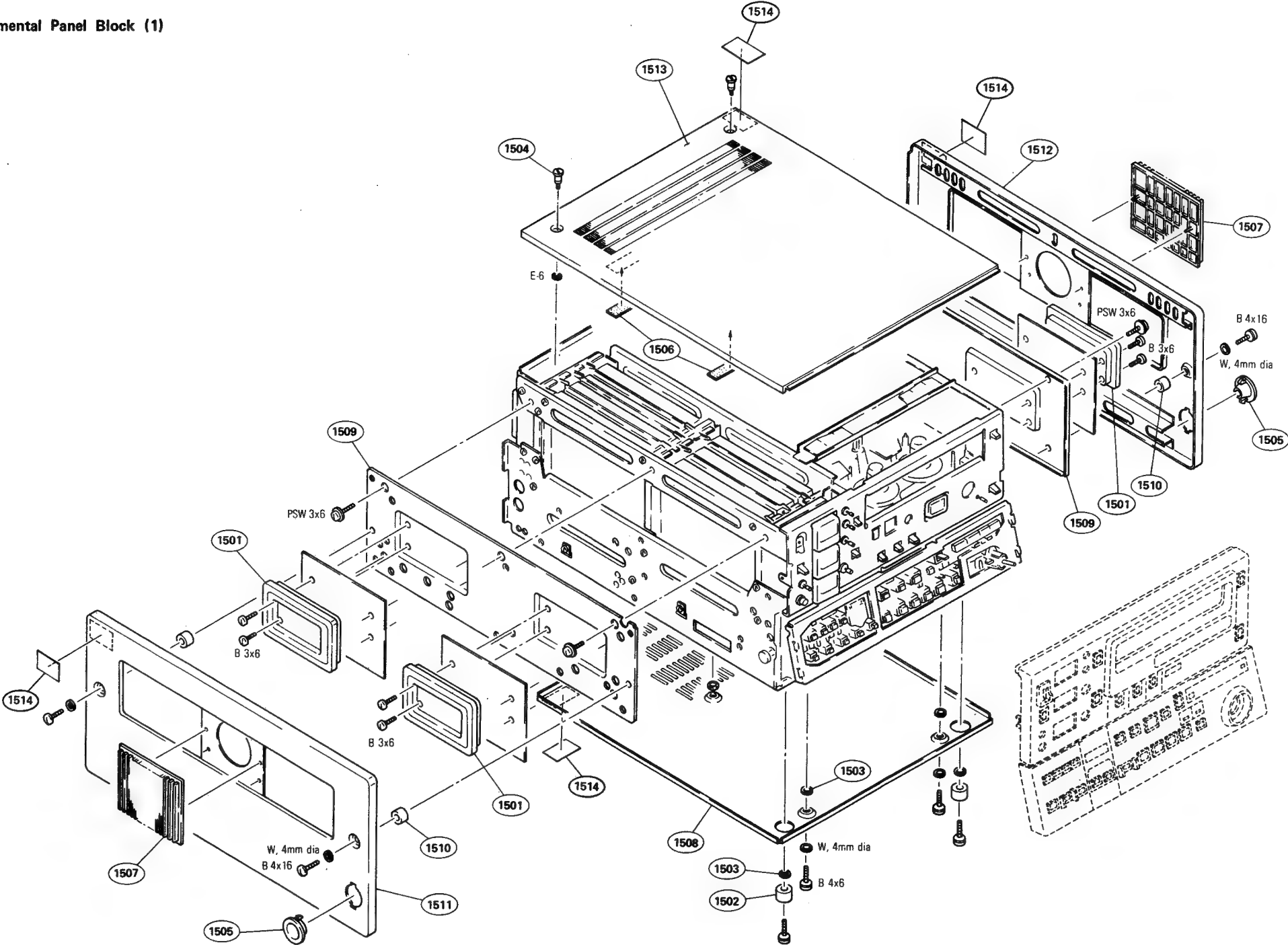
U/C ----- S/N 10351 ~ 11195  
J ----- S/N 10201 ~ 10400  
PM ----- S/N 10001 ~ 10010




ORNAMENTAL PANEL (1)

ORNAMENTAL PANEL (1)

Ornamental Panel Block (1)



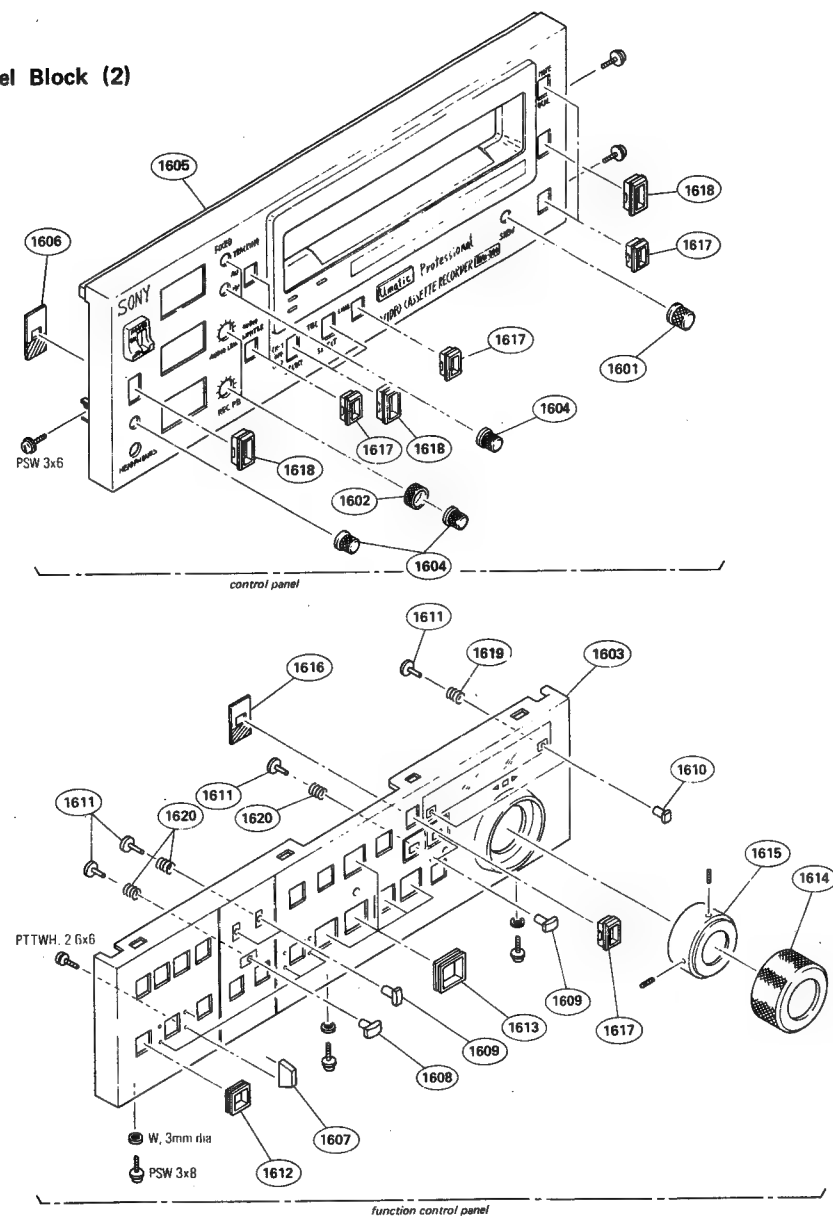
No.	Part No.	Description
1501	X-3642-018-0	HANDLE ASSY
<b>1502</b>	<b>X-4838-902-X</b>	<b>FOOT</b>
1503	3-650-537-00	WASHER
<b>1504</b>	<b>3-668-024-00</b>	<b>SCREW, COIN, CABINET</b>
1505	3-668-025-05	ESCUTCHEON, HINGE STOPPER
1506	3-668-026-00	RETAINER, PC
1507	3-668-335-00	ORNAMENT, SIDE PLATE
1508	3-668-375-00	PLATE, BOTTOM
1509	3-668-382-00	BRACKET, HANDLE
1510	3-668-416-00	SPACER, BRACKET, M4
1511	3-668-418-04	PLATE, SIDE, LEFT
1512	3-668-419-04	PLATE, SIDE, RIGHT
1513	3-668-420-04	LID, UPPER
1514	3-703-848-01	LABEL (N), SUB CAUTION

- NOTE:
- The shaded and -marked components are critical to safety. Replace only with same component as specified.
  - Parts printed in **Bold-Face** type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face** type will be processed, but allow for additional delivery time.
  - Item with no part number and/or no description are not stocked because they are seldom required for routine service.

## ORNAMENTAL PANEL (2)

## PRINTED CIRCUIT BOARD

Ornamental Panel Block (2)



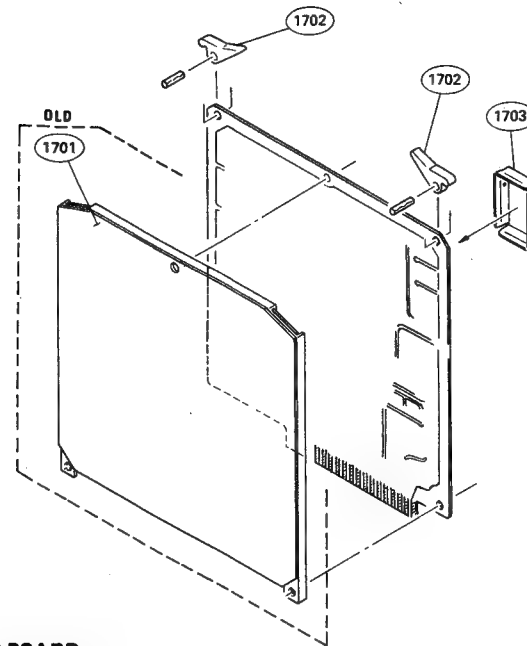
No.	Part No.	Description
1601	X-3651-342-0	KNOB ASSY, CONTROL
1602	X-3668-056-0	KNOB (W) ASSY, CONTROL
1603	X-3668-068-0	PANEL SUB ASSY, KEY (U/C ----- S/N Up to 10200) (J ----- S/N Up to 10150)
	X-3668-068-8	PANEL SUB ASSY, KEY (U/C ----- S/N 10201 and higher) (J ----- S/N 10151 and higher)
1604	X-3668-075-0	KNOB ASSY, CONTROL
1605	X-3668-081-0	PANEL SUB ASSY, FRONT
1606	2-252-623-02	PLATE, SWITCH, LEVER
1607	3-675-986-00	GUARD, REC
1608	3-668-006-02	PUSH BUTTON (15x8)
1609	3-668-007-02	PUSH BUTTON (5x9)
1610	3-668-008-02	PUSH BUTTON (3x5)

No.	Part No.	Description
1611	3-668-009-02	PIN, PUSH BUTTON
1612	3-668-010-00	ESCUTCHEON (12), BUTTON (U/C ----- S/N Up to 10200) (J ----- S/N Up to 10150)
	3-675-892-00	ESCUTCHEON BUTTON (SMALL) (U/C ----- S/N 10201 and higher) (J ----- S/N 10151 and higher)
1613	3-668-011-00	ESCUTCHEON (17), BUTTON (U/C ----- S/N Up to 10200) (J ----- S/N Up to 10150)
	3-675-891-00	ESCUTCHEON BUTTON (LARGE) (U/C ----- S/N 10201 and higher) (J ----- S/N 10151 and higher)
1614	3-668-012-00	RUBBER, DIAL KNOB
1615	3-668-013-00	KNOB, DIAL
1616	3-668-015-00	PLATE (SMALL), SWITCH, LEVER
1617	3-668-016-00	FRAME (SMALL), ORNAMENTAL
1618	3-668-018-00	FRAME (MIDDLE), ORNAMENTAL
1619	4-309-349-00	SPRING, COIL

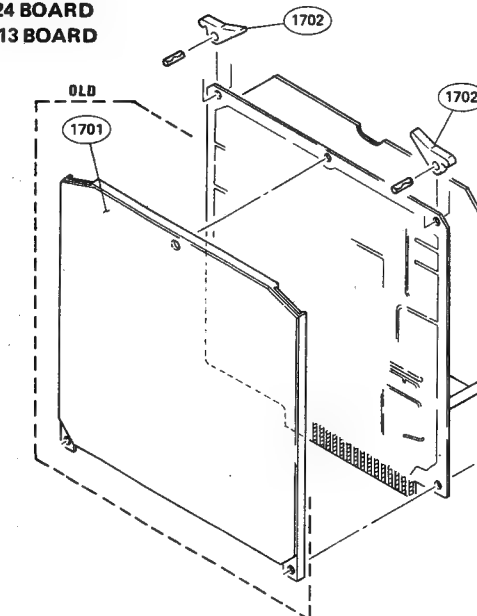
18-31

Printed Circuit Board

MD-15 BOARD

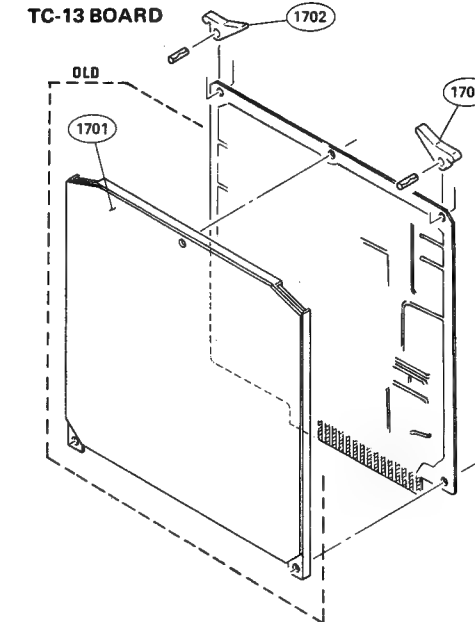


RS-3 BOARD  
SV-24 BOARD  
AU-13 BOARD

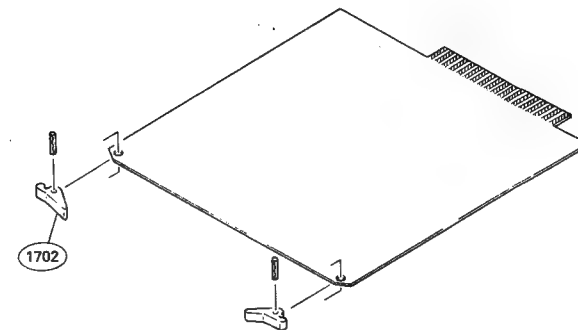


No.	Part No.	Description
1701	X-3668-082-2	CASE ASSY, (A) SHIELD (U/C ----- S/N Up to 10895) (J ----- S/N Up to 10350)
1702	2-251-622-00	LEVER, PC BOARD
1703	3-668-359-00	COVER, UPPER, SHIELD CASE


YD-10 BOARD  
CD-18 BOARD  
TC-13 BOARD



SY-36 BOARD or SY-92 BOARD  
SY-37 BOARD



### NOTE:

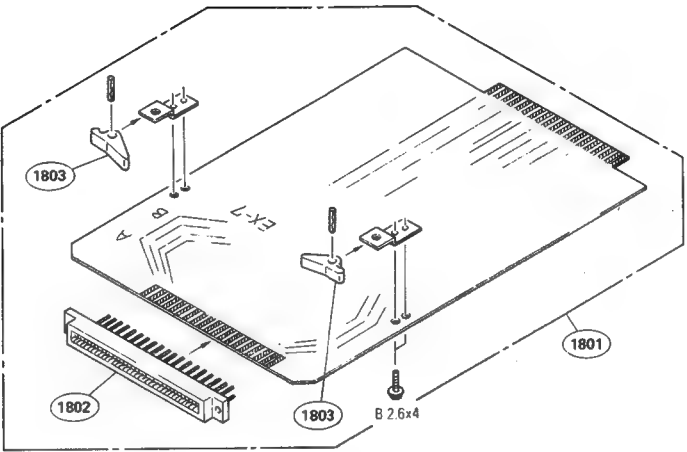
- The shaded and  marked components are critical to safety. Replace only with same components as specified.
- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

18-32

BVU-820




Supplied Accessory



No.	Part No.	Description
<b>1801</b>	<b>A-6724-244-A</b>	<b>EXTENSION BOARD ASSY, EX-7</b>
1802	1-561-654-00	CONNECTOR, CARD 86P
1803	2-251-622-00	LEVER, PC BOARD

NOTE:

1. The shaded and -marked components are critical to safety. Replace only with same components as specified.
2. Parts printed in **Bold-Face** type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face** type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.



### 18-3. ELECTRICAL PARTS LIST

#### 18-3-1. NOTES FOR ELECTRICAL PARTS LIST

1. The shaded and  $\Delta$ -marked components are critical to safety. Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. **Units of Capacitance, Inductance and Resistance**  
All capacitors are in micro farads unless otherwise specified.  
All inductors are in micro henries unless otherwise specified.  
All resistors are in ohms.
4. **Omitted Parts**  
The following parts are not listed in the "electrical parts list".

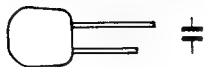
REF.	Description/Parts Number	Fig.No.
C	CAPACITOR,SILVERED MICA	1pF through 750pF 500V
	CAPACITOR,CERAMIC	0.001 $\mu$ F through 0.1 $\mu$ F 50V
	CAPACITOR,MYLAR	0.001 $\mu$ F through 0.22 $\mu$ F $\pm$ 5% 50V
	CAPACITOR,ELECT	0.47 $\mu$ F through 470 $\mu$ F 6.3V through 50(63,100)V
	CAPACITOR,TANTALUM	0.01 $\mu$ F through 100 $\mu$ F 3.15V through 35V
CN	CONNECTOR,PCB	3P through 12P
D	DIODE, 1S1555 or 1SS119	8-719-815-55 or 8-719-911-19
L	INDUCTOR,MICRO	1 $\mu$ H through 33mH $\pm$ 5%
Q	TRANSISTOR,2SC1364	8-729-663-47
R	RESISTOR,CARBON(1/4W)	1 OHM through 1M OHM $\pm$ 5% 1/4W
	RESISTOR,CARBON(1/8W)	1 OHM through 1M OHM $\pm$ 5% 1/8W
	RESISTOR,METAL	10 OHM through 100k OHM $\pm$ 1% 1/4W

# SILVERD MICA, CERAMIC

Fig. 1

SILVERD MICA CAPACITOR

1 pF through 8.2 pF  $\pm 0.5$  pF 500V  
10 pF through 680 pF  $\pm 5\%$  500V  
750 pF  $\pm 10\%$  500V



Parts No. 1-107-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 pF	019	12 pF	204	51 pF	164	220 pF	177
1.2	039	13	205	56	165	240	178
1.5	040	15	206	62	166	270	179
1.8	041	16	207	68	036	300	180
2.2	042	18	208	75	167	330	181
2.7	043	20	209	82	037	360	182
3.3	044	22	210	91	168	390	183
3.9	045	24	211	100	169	430	184
4.7	046	27	157	110	170	470	185
5.1	026	30	158	120	171	510	186
5.6	047	33	159	130	172	560	187
6.8	048	36	160	150	173	620	188
8.2	049	39	161	160	174	680	212
10	202	43	162	180	175	750	258
11	203	47	163	200	176		

E. PARTS

Fig. 2

CERAMIC CAPACITOR

0.001 $\mu$ F through 0.1 $\mu$ F  
50WV



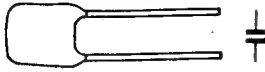
Parts No. 1-161-□□□-00

Value	Parts No. -□□□-	Substitute	Value	Parts No. -□□□-	Substitute
0.001 $\mu$ F	039	(1-102-074-00)	0.01 $\mu$ F	051	(1-101-118-00)
0.0012	040		0.012	052	
0.0015	041		0.015	053	
0.0018	042		0.018	054	
0.0022	043	(1-102-100-00)	0.022	055	(1-101-005-00)
0.0027	044		0.027	056	
0.0033	045		0.033	057	
0.0039	046	(1-102-124-00)	0.039	058	
0.0047	047		0.047	059	(1-101-006-00)
0.0056	048		0.056	060	
0.0068	049		0.068	061	
0.0082	050		0.082	062	
			0.1	063	

# MYLAR, ELECTROLYTIC

Fig. 3

## MYLAR CAPACITOR



0.001 $\mu$ F through 0.22 $\mu$ F  
 $\pm$ 5% 50WV

Parts No. 1-108-□□□-00

Value	Parts No. -□□□-
0.001 $\mu$ F	555
0.0011	556
0.0012	557
0.0013	558
0.0015	559
0.0016	560
0.0018	561
0.0020	562
0.0022	563
0.0024	564
0.0027	565
0.0030	566
0.0033	567
0.0036	568
0.0039	569

Value	Parts No. -□□□-
0.0043 $\mu$ F	570
0.0047	571
0.0051	572
0.0056	573
0.0062	574
0.0068	575
0.0075	576
0.0082	577
0.0091	578
0.01	579
0.011	580
0.012	581
0.013	582
0.015	583
0.016	584

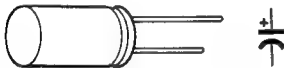
Value	Parts No. -□□□-
0.018 $\mu$ F	585
0.020	586
0.022	587
0.024	588
0.027	589
0.030	590
0.033	591
0.036	592
0.039	593
0.043	594
0.047	595
0.051	596
0.056	597
0.062	598
0.068	599

Value	Parts No. -□□□-
0.075 $\mu$ F	600
0.082	601
0.091	602
0.1	603
0.11	604
0.12	605
0.13	606
0.15	607
0.16	608
0.18	609
0.20	610
0.22	611

Fig. 4

## ELECTROLYTIC CAPACITOR

0.47 $\mu$ F through 470 $\mu$ F  
 6.3WV through 50 (63, 100)WV



Parts No. 1-123-□□□-00

Value	Parts No. -□□□-
0.47 $\mu$ F 50V	379
100	
1 50	380
100	
2.2 50	381
100	
3.3 25	382
35	
50	
100	
4.7 25	369
35	
50	
63	
10 10	356
16	
25	
35	
50	330
22 16	
25	

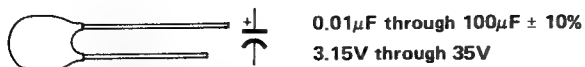
Value	Parts No. -□□□-
22 $\mu$ F 35V	342
50	371
63	
33 6.3	318
10	
16	
25	343
35	
50	372
63	
47 6.3	306
10	
16	332
25	
35	359
50	
100 6.3	307
10	
16	333
25	
35	345

Value	Parts No. -□□□-
100 $\mu$ F 50V	360
220 6.3	308
10	
16	321
25	334
35	346
50	361
330 6.3	309
10	
16	322
25	335
35	347
50	362
470 6.3	298
10	310
16	323
25	336
35	348
50	377
63	

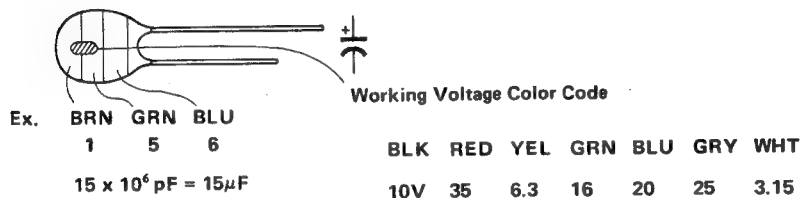
# TANTALUM, CONNECTOR

Fig. 5

## TANTALUM CAPACITOR



NOTE: The value of the parts that are marked by \* in the below table are indicated by color code. (to the value with  $\pm$ 20%)



Parts No. 1-131-□□□-00

Value	Parts No. -□□□-
0.01 $\mu$	35V *396
0.015	35 *397
0.022	35 *398
0.033	35 *399
0.047	35 *400
0.068	35 *401
0.1	35 341
0.15	35 342
0.22	35 343
0.33	25 *409
	35 344
0.47	20 *412
	35 345
0.68	16 *415
	25 *410
	35 346
1.0	10 *418
	25 498

Value	Parts No. -□□□-
1.0 $\mu$	35V 347
1.5	6.3 *421
	20 499
	25 354
	35 348
2.2	3.15 *424
	16 500
	20 361
	25 355
	35 349
3.3	10 501
	16 368
	20 362
	25 356
	35 350
4.7	6.3 502
	10 375
	16 369

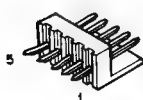
Value	Parts No. -□□□-
4.7 $\mu$	20V 363
	25 357
	35 351
6.8	3.15 503
	6.3 382
	10 376
	16 370
	20 364
	25 358
	35 352
10	3.15 389
	6.3 383
	10 377
	16 371
	20 365
	25 359
	35 353
15	3.15 390
	6.3 384

Value	Parts No. -□□□-
15 $\mu$	10V 378
	16 372
	20 366
	25 360
22	3.15 391
	6.3 385
	10 379
	16 373
	20 367
33	3.15 392
	6.3 386
	10 380
	16 374
47	3.15 393
	6.3 387
	10 381
68	3.15 394
	6.3 388
100	3.15 395

Fig. 6

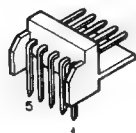
## CONNECTOR

top-type receptacle



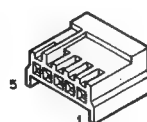
3P	1-560-008-00
5P	1-560-009-00
6P	1-560-010-00
8P	1-560-011-00
10P	1-560-012-00
12P	1-560-013-00

side-type receptacle



3P	1-560-014-00
5P	1-560-015-00
6P	1-560-016-00
8P	1-560-017-00
10P	1-560-018-00
12P	1-560-019-00

plug  
housing contact



3P	1-561-155-00
5P	1-561-156-00
6P	1-561-157-00
8P	1-561-158-00
10P	1-561-159-00
12P	1-561-160-00



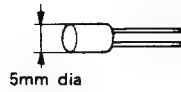
1-560-006-00  
(AWG 20 ~ 26)

1-560-007-00  
(AWG 26 ~ 30)

Fig. 7

## MICRO INDUCTOR

1  $\mu$ H through 470  $\mu$ H  
 $\pm 5\%$

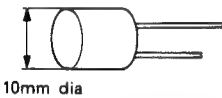


Parts No. 1-407-□□□-XX

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 $\mu$ H	178	4.7 $\mu$ H	186	22 $\mu$ H	161	100 $\mu$ H	169
1.2	179	5.6	187	27	162	120	170
1.5	180	6.8	188	33	163	150	171
1.8	181	8.2	189	39	164	180	172
2.2	182	10	157	47	165	220	173
2.7	183	12	158	56	166	270	174
3.3	184	15	159	68	167	330	175
3.9	185	18	160	82	168	390	176
						470	177

## MICRO INDUCTOR

470  $\mu$ H through 33 mH  
 $\pm 5\%$



Parts No. 1-407-□□□-00

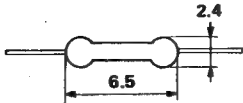
Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
470 $\mu$ H	488	1.5 mH	494	4.7 mH	500	15 mH	506
560	489	1.8	495	5.6	501	18	507
680	490	2.2	496	6.8	502	22	508
820	491	2.7	497	8.2	503	27	509
1 mH	492	3.3	498	10	504	33	510
1.2	493	3.9	499	12	505		

CARBON (1/4W)

Fig. 8

CARBON RESISTOR (1/4W)

± 5%, 1/4W, non-special type  
1 Ω through 1 MΩ



Parts No. 1-246-□□□-00

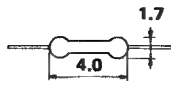
Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 Ω	401	33 Ω	437	1 kΩ	473	33 kΩ	509
1.1	402	36	438	1.1	474	36	510
1.2	403	39	439	1.2	475	39	511
1.3	404	43	440	1.3	476	43	512
1.5	405	47	441	1.5	477	47	513
1.6	406	51	442	1.6	478	51	514
1.8	407	56	443	1.8	479	56	515
2	408	62	444	2	480	62	516
2.2	409	68	445	2.2	481	68	517
2.4	410	75	446	2.4	482	75	518
2.7	411	82	447	2.7	483	82	519
3	412	91	448	3.0	484	91	520
3.3	413	100 Ω	449	3.3	485	100 kΩ	521
3.6	414	110	450	3.6	486	110	522
3.9	415	120	451	3.9	487	120	523
4.3	416	130	452	4.3	488	130	524
4.7	417	150	453	4.7	489	150	525
5.1	418	160	454	5.1	490	160	526
5.6	419	180	455	5.6	491	180	527
6.2	420	200	456	6.2	492	200	528
6.8	421	220	457	6.8	493	220	529
7.5	422	240	458	7.5	494	240	530
8.2	423	270	459	8.2	495	270	531
9.1	424	300	460	9.1	496	300	532
10 Ω	425	330	461	10 kΩ	497	330	533
11	426	360	462	11	498	360	534
12	427	390	463	12	499	390	535
13	428	430	464	13	500	430	536
15	429	470	465	15	501	470	537
16	430	510	466	16	502	510	538
18	431	560	467	18	503	560	539
20	432	620	468	20	504	620	540
22	433	680	469	22	505	680	541
24	434	750	470	24	506	750	542
27	435	820	471	27	507	820	543
30	436	910	472	30	508	910	544
						1 MΩ	545

E. PARTS



Fig. 9

CARBON RESISTOR (1/8W)

±5%, 1/8W, non-special type  
2.2Ω through 1MΩ

Parts No. 1-246-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1Ω	—	33Ω	765	1kΩ	783	33kΩ	801
1.1	—	36	826	1.1	844	36	862
1.2	—	39	766	1.2	784	39	802
1.3	—	43	827	1.3	845	43	863
1.5	—	47	767	1.5	785	47	803
1.6	—	51	828	1.6	846	51	864
1.8	—	56	768	1.8	786	56	804
2	—	62	829	2	847	62	865
2.2	751	68	769	2.2	787	68	805
2.4	812	75	830	2.4	848	75	866
2.7	752	82	770	2.7	788	82	806
3	813	91	831	3.0	849	91	867
3.3	753	100Ω	771	3.3	789	100kΩ	807
3.6	814	110	832	3.6	850	110	868
3.9	754	120	772	3.9	790	120	808
4.3	815	130	833	4.3	851	130	869
4.7	755	150	773	4.7	791	150	809
5.1	816	160	834	5.1	852	160	870
5.6	756	180	774	5.6	792	180	810
6.2	817	200	835	6.2	853	200	871
6.8	757	220	775	6.8	793	220	811
7.5	818	240	836	7.5	854		
8.2	758	270	776	8.2	794		
9.1	819	300	837	9.1	855		
10Ω	759	330	777	10kΩ	795		
11	820	360	838	11	856		
12	760	390	778	12	796		
13	821	430	839	13	857		
15	761	470	779	15	797		
16	822	510	840	16	858		
18	762	560	780	18	798		
20	823	620	841	20	859		
22	763	680	781	22	799		
24	824	750	842	24	860		
27	764	820	782	27	800		
30	825	910	843	30	861		

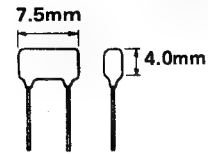
Parts No. 1-247-□□□-00

Value	Parts No. -□□□-
240kΩ	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1MΩ	053

METAL (1/4W)

Fig. 10

METAL FILM RESISTOR ± 1%, 1/4W  
10Ω through 100kΩ



Parts No. 1-214-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
10Ω	084	100Ω	108	1.0kΩ	132	10kΩ	156
11	085	110	109	1.1	133	11	157
12	086	120	110	1.2	134	12	158
13	087	130	111	1.3	135	13	159
15	088	150	112	1.5	136	15	160
16	089	160	113	1.6	137	16	161
18	090	180	114	1.8	138	18	162
20	091	200	115	2.0	139	20	163
22	092	220	116	2.2	140	22	164
24	093	240	117	2.4	141	24	165
27	094	270	118	2.7	142	27	166
30	095	300	119	3.0	143	30	167
33	096	330	120	3.3	144	33	168
36	097	360	121	3.6	145	36	169
39	098	390	122	3.9	146	39	170
43	099	430	123	4.3	147	43	171
47	100	470	124	4.7	148	47	172
51	101	510	125	5.1	149	51	173
56	102	560	126	5.6	150	56	174
62	103	620	127	6.2	151	62	175
68	104	680	128	6.8	152	68	176
75	105	750	129	7.5	153	75	177
82	106	820	130	8.2	154	82	178
91	107	910	131	9.1	155	91	179
						100	180

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□, CV□□	CAPACITOR	IC□□	IC	R□□, RV□□	RESISTOR
CN□□	CONNECTOR	L□□, LV□□	INDUCTOR	RY□□	RELAY
CP□□	COMBINATION PARTS	M□□	MOTOR	S□□	SWITCH
D□□	DIODE	ME□□	METER	SB□□	SOLAR BATTERY
DL□□	DELAY LINE	PL□□	LAMP	T□□	TRANSFORMER
F□□	FUSE	PM□□	SOLENOID	TH□□	THERMISTOR
FL□□	FILTER	Q□□	TRANSISTOR	X□□	CRYSTAL
H□□	HEAD				

## AO-2, AO-3, AU-13 (AU-25)

Ref. No. Parts No. Description

### AO-2 BOARD

1-604-375-00 PRINTED CIRCUIT BOARD,  
AO-2

S1 1-516-963-00 LEVER SLIDE  
"AUDIO MONITOR"

Ref. No. Parts No. Description

RV1 1-224-251-XX VAR, METAL 4.7K  
RV2 1-224-251-XX VAR, METAL 4.7K  
RV3 1-224-251-XX VAR, METAL 4.7K

T1 1-423-225-00 INPUT/OUTPUT  
T2 1-423-225-00 INPUT/OUTPUT  
T3 1-423-225-00 INPUT/OUTPUT

### AO-3 BOARD

A-6713-106-A MOUNTED CIRCUIT BOARD,  
AO-3

D1 8-719-200-02 10E-2  
D2 8-719-200-02 10E-2  
D3 8-719-200-02 10E-2

FL1 1-235-030-00 LOWPASS  
FL2 1-235-030-00 LOWPASS

IC1 8-751-701-13 CX-170-13 (SONY)  
IC2 8-751-701-13 CX-170-13 (SONY)  
IC3 8-751-701-13 CX-170-13 (SONY)  
IC4 8-720-002-97 TX-429D (SONY)  
IC5 8-720-002-97 TX-429D (SONY)

Q1 8-760-335-10 2SC1474  
Q2 8-760-335-10 2SC1474  
Q3 8-760-335-10 2SC1474  
Q4 8-729-612-77 2SA1027R  
Q5 8-729-201-04 2SC2878

Q6 8-729-612-77 2SA1027R  
Q7 8-729-201-04 2SC2878  
Q8 8-729-612-77 2SA1027R  
Q9 8-729-201-04 2SC2878

R1 1-244-861-00 CARBON 330 5% 1/2W

### AU-13 BOARD

A-6713-108-B MOUNTED CIRCUIT BOARD,  
AU-13 (WITH AU-25)

C8 1-130-491-00 MYLAR 0.047 5% 50V  
C20 1-130-491-00 MYLAR 0.047 5% 50V  
C21 1-130-491-00 MYLAR 0.047 5% 50V  
C40 1-102-114-00 CERAMIC 470PF 10% 50V  
C84 1-102-112-00 CERAMIC 330P 10% 50V

C108 1-130-491-00 MYLAR 0.047 5% 50V  
C120 1-130-491-00 MYLAR 0.047 5% 50V  
C121 1-130-491-00 MYLAR 0.047 5% 50V  
C140 1-102-114-00 CERAMIC 470PF 10% 50V  
C503 1-129-714-00 FILM 0.01 10% 630V

C514 1-129-712-00 FILM 0.0068 10% 630V  
C517 1-129-712-00 FILM 0.0068 10% 630V  
C520 1-129-708-00 FILM 0.0033 10% 630V  
C521 1-109-169-00 MICA 910PF 5% 300V  
C522 1-109-169-00 MICA 910PF 5% 300V

C600 1-102-114-00 CERAMIC 470PF 10% 50V  
C603 1-102-114-00 CERAMIC 470PF 10% 50V  
C604 1-102-114-00 CERAMIC 470PF 10% 50V

D9 8-719-162-07 RD6.2E-B  
D10 8-719-709-25 1S1925-P  
D109 8-719-162-07 RD6.2E-B  
D110 8-719-709-25 1S1925-P  
D208 8-719-162-07 RD6.2E-B

D501 8-719-200-02 10E-2  
D502 8-719-200-02 10E-2

FL1 1-235-030-00 LOWPASS  
FL101 1-235-030-00 LOWPASS

# AU-13 (AU-25)

## E. PARTS

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC1	8-759-276-17	TA7617AP (TOSHIBA)	Q7	8-729-201-04	2SC2878
IC2	8-720-002-97	TX-429D-7 (SONY)	Q9	8-729-201-04	2SC2878
IC3	8-720-002-97	TX-429D-7 (SONY)	Q11	8-729-177-43	2SD774
IC4	8-720-002-97	TX-429D-7 (SONY)	Q12	8-729-374-02	2SB740
IC5	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q101	8-729-201-04	2SC2878
IC101	8-759-276-17	TA7617AP (TOSHIBA)	Q102	8-729-612-77	2SA1027R
IC102	8-720-002-97	TX-429D-7 (SONY)	Q103	8-729-201-04	2SC2878
IC103	8-720-002-97	TX-429D-7 (SONY)	Q104	8-729-201-04	2SC2878
IC104	8-720-002-97	TX-429D-7 (SONY)	Q106	8-729-201-04	2SC2878
IC201	8-759-240-71	TC4071BP (CD4071BE; RCA)	Q107	8-729-201-04	2SC2878
IC202	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q109	8-729-201-04	2SC2878
IC203	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q201	8-729-612-77	2SA1027R
IC204	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q202	8-729-612-77	2SA1027R
IC205	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q203	8-729-612-77	2SA1027R
IC206	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q204	8-729-612-77	2SA1027R
IC207	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q205	8-729-612-77	2SA1027R
IC208	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q206	8-729-612-77	2SA1027R
IC209	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q503	8-729-201-04	2SC2878
IC601	8-759-345-38	HD14538BP (MC14538BCP; MOT)	Q504	8-729-612-77	2SA1027R
IC602	8-759-240-30	TC4030BP (CD4030BE; RCA)	Q505	8-729-177-43	2SD774
IC603	8-759-240-71	TC4071BP (CD4071BE; RCA)	Q506	8-729-612-77	2SA1027R
IC604	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q507	8-729-177-43	2SD774
IC605	8-759-345-38	HD14538BP (MC14538BCP; MOT)	Q508	8-729-177-43	2SD774
IC606	8-759-240-13	TC4013BP (CD4013BE; RCA)	Q509	8-729-177-43	2SD774
			Q510	8-729-177-44	2SD774-5
L1	1-407-519-00	FERRITE CORE, 7T	Q511	8-729-177-43	2SD774
L101	1-407-519-00	FERRITE CORE, 7T	Q512	8-729-177-43	2SD774
			Q513	8-729-177-44	2SD774-5
			Q514	8-729-177-43	2SD774
			Q515	8-729-177-43	2SD774
LV1	1-409-295-00	VAR, 22mH	Q516	8-729-177-44	2SD774-5
LV2	1-409-295-00	VAR, 22mH	Q517	8-729-177-43	2SD774
LV3	1-407-288-00	VAR, 4.7mH	Q518	8-729-177-43	2SD774
LV101	1-409-295-00	VAR, 22mH	Q601	8-729-384-48	2SA844
LV102	1-409-295-00	VAR, 22mH			
LV103	1-407-288-00	VAR, 4.7mH			
LV501	1-407-286-00	VAR, 2.2mH	R94	1-244-861-00	CARBON 330 5% 1/2W
LV502	1-407-284-00	VAR, 1mH	R95	1-244-861-00	CARBON 330 5% 1/2W
LV503	1-407-284-00	VAR, 1mH	R511	1-244-817-00	CARBON 4.7 5% 1/2W
LV504	1-407-283-00	VAR, 0.68mH	R523	1-244-825-00	CARBON 10 5% 1/2W
			R525	1-244-833-00	CARBON 22 5% 1/2W
LV505	1-407-283-00	VAR, 0.68mH			
LV506	1-407-282-00	VAR, 0.47mH	R531	1-244-825-00	CARBON 10 5% 1/2W
			R532	1-244-833-00	CARBON 22 5% 1/2W
Q1	8-729-201-04	2SC2878	R539	1-244-825-00	CARBON 10 5% 1/2W
Q2	8-729-612-77	2SA1027R	R540	1-244-825-00	CARBON 10 5% 1/2W
Q3	8-729-201-04	2SC2878			
Q4	8-729-201-04	2SC2878			
Q6	8-729-201-04	2SC2878			

# AU-13 (AU-25), CC-9, CC-10, CC-11, CD-18 (DL-1)

Ref. No.	Parts No.	Description
RV1	1-224-254-XX	VAR, METAL 47K
RV2	1-224-253-XX	VAR, METAL 22K
RV3	1-224-254-XX	VAR, METAL 47K
RV4	*1 1-224-253-XX	VAR, METAL 22K
	*2 1-224-251-XX	VAR, METAL 4.7K
RV5	1-224-250-XX	VAR, METAL 2.2K
RV6	1-224-134-XX	VAR, METAL 470K
RV7	*3 1-224-248-XX	VAR, METAL 470
RV101	1-224-254-XX	VAR, METAL 47K
RV102	1-224-253-XX	VAR, METAL 22K
RV103	1-224-254-XX	VAR, METAL 47K
RV104	*1 1-224-253-XX	VAR, METAL 22K
	*2 1-224-251-XX	VAR, METAL 4.7K
RV105	1-224-250-XX	VAR, METAL 2.2K
RV106	1-224-134-XX	VAR, METAL 470K
RV107	*3 1-224-248-XX	VAR, METAL 470
RV202	1-224-255-XX	VAR, METAL 100K
RV203	1-224-255-XX	VAR, METAL 100K
RV204	1-224-255-XX	VAR, METAL 100K
RV205	1-224-255-XX	VAR, METAL 100K
RV206	1-224-255-XX	VAR, METAL 100K
RV207	1-224-255-XX	VAR, METAL 100K
RV208	1-224-255-XX	VAR, METAL 100K
RV209	1-224-255-XX	VAR, METAL 100K
RV501	1-224-247-XX	VAR, METAL 100
RV502	1-224-247-XX	VAR, METAL 100
RY501	1-515-475-00	12V, 280 OHM
RY502	1-515-475-00	12V, 280 OHM
T1	1-427-562-11	INPUT/OUTPUT
T2	1-427-284-00	OUTPUT
T101	1-427-562-11	INPUT/OUTPUT
T102	1-427-284-00	OUTPUT
T501	1-433-195-00	OSC.
T502	1-433-196-00	BIAS
T503	1-433-196-00	BIAS
T504	1-433-196-00	BIAS
TH1	1-800-200-00	S-3K
TH101	1-800-200-00	S-3K

Ref. No.	Parts No.	Description
CC-9 BOARD		
	1-604-429-00	PRINTED CIRCUIT BOARD, CC-9
CC-10 BOARD		
	1-604-430-00	PRINTED CIRCUIT BOARD, CC-10
IC1	8-719-140-05	PS4005 (NEC)
CC-11 BOARD		
	1-604-431-00	PRINTED CIRCUIT BOARD, CC-11
IC2	8-719-140-05	PS4005 (NEC)
CD-18 BOARD		
	A-6711-307-A	MOUNTED CIRCUIT BOARD, CD-18 (with DL-1)
	1-560-035-00	B-B 5P
	1-602-807-00	PRINTED CIRCUIT BOARD, DL-1
C35	1-102-406-00	CERAMIC 2PF CH 50V
C36	1-102-508-00	CERAMIC 10PF CH 50V
C39	1-102-761-00	CERAMIC 75PF UJ 5% 50V
C74	1-102-528-00	CERAMIC 91PF CH 5% 50V
C80	1-102-529-00	CERAMIC 100PF CH 5% 50V

NOTE: \*1 Serial No. 10,001 to 10,050 (J)  
Serial No. 10,001 to 10,100 (U/C)  
\*2 Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)

\*3 Serial No. 10,001 to 10,200 (J)  
Serial No. 10,001 to 10,645 (U/C)

# CD-18 (DL-1)

## E. PARTS

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
C416	1-102-110-00	CERAMIC 220PF 5% 50V	Q1	8-724-375-01	2SC403C
C417	1-102-110-00	CERAMIC 220PF 5% 50V	Q2	8-724-375-01	2SC403C
C419	1-102-106-00	CERAMIC 100PF 5% 50V	Q5	8-729-384-48	2SA844
			Q6	8-729-384-48	2SA844
			Q7	8-724-375-01	2SC403C
D201	8-719-709-25	1S1925-P	Q12	8-724-375-01	2SC403C
D404	8-719-709-25	1S1925-P	Q13	8-729-384-48	2SA844
D408	8-719-102-64	RD4.7EN1	Q14	8-729-201-04	2SC2878
			Q16	8-729-201-04	2SC2878
			Q17	8-724-375-01	2SC403C
DL1	1-415-096-31	0.3μS	Q18	8-724-375-01	2SC403C
DL201	1-415-096-31	0.3μS	Q19	8-724-375-01	2SC403C
DL203	1-415-065-00	1H	Q20	8-729-201-04	2SC2878
			Q21	8-729-201-04	2SC2878
			Q22	8-724-375-01	2SC403C
FL1	1-235-048-00	LOW PASS	Q25	8-724-375-01	2SC403C
FL2	1-235-047-00	BAND PASS	Q26	8-724-375-01	2SC403C
			Q27	8-724-375-01	2SC403C
			Q28	8-729-384-48	2SA844
			Q31	8-724-375-01	2SC403C
IC1	8-759-270-60	TA7060P (TOSHIBA)	Q32	8-724-375-01	2SC403C
IC2	8-759-245-28	TC4528BP (MC14528BCP; MOTOROLA)	Q36	8-725-412-00	2SC1124
IC4	8-751-300-00	CX-130 (SONY)	Q37	8-725-412-00	2SC1124
IC5	8-758-720-00	CX-872 (SONY)	Q201	8-724-375-01	2SC403C
IC6	8-759-908-59	CX-859 (SONY)	Q202	8-729-201-04	2SC2878
IC7	8-759-270-60	TA7060P (TOSHIBA)	Q203	8-729-384-48	2SA844
IC201	8-749-938-90	BX-389 (SONY)	Q204	8-729-201-04	2SC2878
IC202	8-749-938-80	BX-388 (SONY)	Q205	8-724-375-01	2SC403C
IC203	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q206	8-724-375-01	2SC403C
IC204	8-759-969-13	SN16913P (TI)	Q207	8-724-375-01	2SC403C
IC205	8-759-270-76	TA7076P (TOSHIBA)	Q208	8-724-375-01	2SC403C
IC206	8-759-245-28	TC4528BP (MC14528BCP; MOTOROLA)	Q209	8-724-375-01	2SC403C
IC207	8-759-245-28	TC4528BP (MC14528BCP; MOTOROLA)	Q210	8-729-384-48	2SA844
IC208	8-751-300-00	CX-130 (SONY)	Q211	8-724-375-01	2SC403C
IC209	8-759-270-60	TA7060P (TOSHIBA)	Q212	8-724-375-01	2SC403C
IC210	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q213	8-729-201-04	2SC2878
IC401	8-759-270-76	TA7076P (TOSHIBA)	Q214	8-724-375-01	2SC403C
IC402	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q215	8-729-113-32	2SB733
IC403	8-759-045-38	MC14538BCP (MOTOROLA)	Q216	8-724-375-01	2SC403C
IC404	8-759-245-28	TC4528BP (MC14528BCP; MOTOROLA)	Q217	8-724-375-01	2SC403C
IC405	8-759-045-38	MC14538BCP (MOTOROLA)	Q218	8-724-375-01	2SC403C
IC406	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q219	8-724-375-01	2SC403C
			Q220	8-724-375-01	2SC403C
			Q221	8-724-375-01	2SC403C
			Q222	8-724-375-01	2SC403C
			Q223	8-724-375-01	2SC403C
			Q224	8-724-375-01	2SC403C
LV2	1-411-104-00	BPT-5	Q225	8-724-375-01	2SC403C
LV3	1-407-570-00	VAR 15	Q226	8-724-375-01	2SC403C
			Q227	8-724-375-01	2SC403C
			Q228	8-724-375-01	2SC403C
			Q229	8-729-384-48	2SA844
			Q230	8-729-384-48	2SA844
			Q401	8-729-201-04	2SC2878
			Q402	8-729-201-04	2SC2878

Ref. No.	Parts No.	Description
Q405	8-724-375-01	2SC403C
Q406	8-729-201-04	2SC2878
Q407	8-729-201-04	2SC2878
R24	1-244-849-00	CARBON 100 1/2W 5%
R31	1-244-841-00	CARBON 47 1/2W 5%
R48	1-244-850-00	CARBON 110 1/2W 5%
R60	1-212-716-00	METAL 390K 1/2W 1%
R61	1-212-724-00	METAL 820K 1/2W 1%
R152	1-213-124-00	METAL 27 1W 5%
R153	1-213-124-00	METAL 27 1W 5%
R421	1-212-697-00	METAL 62K 1/2W 1%
R422	1-212-703-00	METAL 110K 1/2W 1%
RV1	1-224-250-XX	VAR, METAL 2.2K
RV3	1-224-251-XX	VAR, METAL 4.7K
RV4	1-224-253-XX	VAR, METAL 22K
RV5	1-224-550-21	VAR, METAL 220
RV6	1-224-251-XX	VAR, METAL 4.7K
RV7	1-224-660-21	VAR, METAL 1K
RV8	1-224-252-XX	VAR, METAL 10K
RV201	1-224-250-XX	VAR, METAL 2.2K
RV202	1-224-255-XX	VAR, METAL 100K
RV203	1-224-253-XX	VAR, METAL 22K
RV204	1-224-254-XX	VAR, METAL 47K
RV206	1-224-253-XX	VAR, METAL 22K
RV207	1-224-254-XX	VAR, METAL 47K
RV208	1-224-252-XX	VAR, METAL 10K
RV209	1-224-249-XX	VAR, METAL 1K
RV210	1-224-250-XX	VAR, METAL 2.2K
RV211	1-224-250-XX	VAR, METAL 2.2K
RV212	1-224-251-XX	VAR, METAL 4.7K
RV213	1-224-251-XX	VAR, METAL 4.7K
RV215	1-224-255-XX	VAR, METAL 100K
RV216	1-226-702-00	VAR, METAL 2.2K (S/N. Up to 10080 (U/C)) small type (S/N. Up to 10020 (J))
RV216	1-224-250-XX	VAR, METAL 2.2K (S/N. 10081 and higher (U/C)) (S/N. 10021 and higher (J))
RV401	1-224-252-XX	VAR, METAL 10K
RV402	1-224-252-XX	VAR, METAL 10K
RV403	1-224-255-XX	VAR, METAL 100K
RV404	1-224-255-XX	VAR, METAL 100K
S1	1-552-509-00	DIP "SHARP/SOFT"
S2	1-552-509-00	DIP "APC"
T1	1-425-785-21	BAT
T2	1-425-982-00	BPT
X1	1-527-376-00	OSC. 3.579545MHz

Ref. No. Parts No. Description

## DA-6 BOARD

**NOTE:** The DA-6 board is mounted on the upper drum assembly, and the dynamic balance adjustment of the whole upper drum assembly is performed in the factory. Therefore DA-6 mounted circuit board and upper drum assembly cannot be replaced individually, the whole upper drum assembly must be replaced when DA-6 board fails.

D11	8-719-900-95	V09G
D12	8-719-139-27	RD39EB4Z
D13	8-719-139-27	RD39EB4Z
D14	8-719-900-95	V09G
D21	8-719-900-95	V09G
D22	8-719-139-27	RD39EB4Z
D23	8-719-139-27	RD39EB4Z
D24	8-719-900-95	V09G
IC11	8-743-944-00	BX-3944 (SONY)
IC21	8-743-944-00	BX-3944 (SONY)
Q11	8-724-375-01	2SC403C
Q21	8-724-375-01	2SC403C
T1	1-423-251-00	RF INPUT
T2	1-423-251-00	RF INPUT

## DT-3 BOARD

A-6715-152-A MOUNTED CIRCUIT BOARD,  
DT-3

D6	8-719-175-07	RD7.5EB
D12	8-719-982-04	ERB81-004
D26	8-719-162-07	RD6.2EB
D27	8-719-815-59	1S1555-S
IC1	8-759-245-16	TC4516BP (MC14516BCP; MOTOROLA)
IC2	8-759-245-16	TC4516BP (MC14516BCP; MOTOROLA)
IC3	8-759-040-77	MC14077BCP (CD4077BE; RCA)
IC4	8-759-240-25	TC4025BP (CD4025BE; RCA)
IC5	8-759-240-01	TC4001BP (CD4001BE; RCA)

IC6	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC55	8-759-132-40	μPC324C (LM324; NSC)
IC7	8-759-045-84	MC14584BCP (MOTOROLA)	IC56	8-759-132-40	μPC324C (LM324; NSC)
IC8	8-759-240-30	TC4030BP (CD4030BE; RCA)	IC57	8-759-645-17	M54517P (MITSUBISHI)
IC9	8-759-240-82	TC4082BP (CD4082BE; RCA)	IC58	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC12	8-759-240-73	TC4073BP (CD4073BE; RCA)	IC59	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC13	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC60	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC14	8-759-240-30	TC4030BP (CD4030BE; RCA)	IC61	8-759-245-20	TC4520BP (MC14520BCP; MOTOROLA)
IC15	8-759-240-71	TC4071BP (CD4071BE; RCA)	IC62	8-759-145-28	μPD4528C (MC14528BCP; MOTOROLA)
IC16	8-759-240-75	TC4075BP (CD4075BE; RCA)	IC63	8-759-045-38	MC14538BCP (MOTOROLA)
IC17	8-759-145-28	μPD4528C (MC14528BCP; MOTOROLA)	IC64	8-759-240-29	TC4029BP (CD4029BE; RCA)
IC18	8-759-345-38	HD14538BP (MC14538BCP; MOTOROLA)	IC65	8-759-240-27	TC4027BP (CD4027BE; RCA)
IC20	8-759-345-38	HD14538BP (MC14538BCP; MOTOROLA)	IC66	8-759-240-40	TC4040BP (CD4040BE; RCA)
IC21	8-759-240-29	TC4029BP (CD4029BE; RCA)	IC67	8-759-645-17	M54517P (MITSUBISHI)
IC22	8-759-240-29	TC4029BP (CD4029BE; RCA)	IC68	8-759-921-91	TL191CN (TI)
IC24	8-759-240-24	TC4024BP (CD4024BE; RCA)	IC69	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)
IC25	8-759-240-43	TC4043BP (CD4043BE; RCA)	IC70	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC26	8-759-045-85	MC14585BCP (TC4585BP; TOSHIBA)	IC71	8-759-045-38	MC14538BCP (MOTOROLA)
IC27	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)	IC72	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)
IC28	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC73	8-759-132-40	μPC324C (LM324; NSC)
IC29	8-759-045-85	MC14585BCP (TC4585BP; TOSHIBA)	IC74	8-759-240-13	TC4013BP (TOSHIBA)
IC30	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC75	8-759-045-84	MC14584BCP (MOTOROLA)
IC31	8-759-040-46	MC14046BCP (CD4046BE; RCA)	IC78	8-759-045-84	MC14584BCP (MOTOROLA)
IC32	8-759-045-26	MC14526BCP (MOTOROLA)	IC79	8-759-045-84	MC14584BCP (MOTOROLA)
IC33	8-759-240-29	TC4029BP (CD4029BE; RCA)	Q2	8-724-375-01	2SC403C
IC34	8-759-240-18	TC4018BP (CD4018BE; RCA)	Q3	8-724-375-01	2SC403C
IC35	8-759-240-18	TC4018BP (CD4018BE; RCA)	Q4	8-724-375-01	2SC403C
IC36	8-759-240-18	TC4018BP (CD4018BE; RCA)	RV3	1-226-772-00	VAR, METAL 4.7K
IC37	8-759-045-26	MC14526BCP (MOTOROLA)	RV4	1-226-771-00	VAR, METAL 1K
IC38	8-759-240-51	TC4051BP (CD4051BE; RCA)	RV5	1-226-775-00	VAR, METAL 100K
IC39	8-759-045-51	MC14551BCP (MOTOROLA)	RV7	1-226-776-00	VAR, METAL 220K
IC40	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)	RV8	1-226-776-00	VAR, METAL 220K
IC41	8-759-240-13	TC4013BP (TOSHIBA)	RV9	1-226-772-00	VAR, METAL 4.7K
IC42	8-759-132-40	μPC324C (LM324; NSC)	RV10	1-226-772-00	VAR, METAL 4.7K
IC43	8-759-132-40	μPC324C (LM324; NSC)	RV11	1-226-772-00	VAR, METAL 4.7K
IC44	8-759-132-40	μPC324C (LM324; NSC)	RV12	1-226-772-00	VAR, METAL 4.7K
IC45	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	RV13	1-226-775-00	VAR, METAL 100K
IC46	8-759-132-40	μPC324C (LM324; NSC)	RV14	1-226-775-00	VAR, METAL 100K
IC47	8-759-132-40	μPC324C (LM324; NSC)	RV15	1-226-703-00	VAR, METAL 10K
IC48	8-759-132-40	μPC324C (LM324; NSC)	RV16	1-226-703-00	VAR, METAL 10K
IC49	8-759-729-01	NJM2901N (JRC)	RV19	1-226-776-00	VAR, METAL 220K
IC50	8-759-921-91	TL191CN (TI)	RV20	1-226-774-00	VAR, METAL 47K
IC51	8-759-921-91	TL191CN (TI)	SW1	1-552-509-00	DIP
IC52	8-759-921-91	TL191CN (TI)			
IC53	8-759-145-58	μPC4558C (RC4558; RAYTHEON)			
IC54	8-759-132-40	μPC324C (LM324; NSC)			



# DV-3, EK-2, EK-3, EM-1, FC-10, FU-13, HP-5

Ref. No. Parts No. Description

## DV-3 BOARD

1-605-756-00 PRINTED CIRCUIT BOARD,  
DV-3 (BRUSH)

## EK-2 BOARD

1-604-354-00 PRINTED CIRCUIT BOARD,  
EK-2

IC1 8-719-140-05 PS4005 (NEC)

## EK-3 BOARD

1-604-355-00 PRINTED CIRCUIT BOARD,  
EK-3

IC1 8-719-104-42 PS4005-L (NEC)

## EM-1 BOARD

A-6748-123-B DME ASS'Y EM-1

### NOTE:

DME 1 and DME 2 are precisely calibrated their physical position on EM-1 board in the factory by precision fixture. Do not replace only DME 1 or DME 2. Replace the entire DME ASS'Y EM-1, A-6748-123-B.

## FC-10 BOARD

A-6711-423-A MOUNTED CIRCUIT BOARD,  
FC-10

IC1 8-751-300-00 CX130 (SONY)  
IC2 8-759-324-11 HA12411 (HITACHI)  
IC3 8-749-909-15 BX3915A (SONY)  
IC4 8-759-240-30 TC4030BP (CD4030BE; RCA)  
IC5 8-759-345-38 HD14538BP (HITACHI)

IC6 8-759-240-13 TC4013BP (TOSHIBA)  
IC7 8-759-240-11 TC4011BP (CD4011BE; RCA)

Q1 8-729-612-77 2SA1027R  
Q2 8-724-375-01 2SC403C  
Q3 8-724-375-01 2SC403C

R1 1-247-217-00 CARBON 110 5% 1/2W

RV1 1-224-255-XX VAR, METAL 100K

BVU-820/PM

Ref. No. Parts No. Description

## FU-13 BOARD

1-604-556-00 PRINTED CIRCUIT BOARD,  
FU-13

1-517-072-00 HOLDER, FUSE

F3 1-532-277-00 0.25A, 250V

F4 1-532-277-00 0.25A, 250V

F5 1-532-509-XX 6.3A (FOR U/C, PM)

F5 1-532-422-00 6.3A (FOR J)

F6 1-532-272-XX 5A (FOR U/C, PM)

F6 1-532-421-00 5A (FOR J)

F7 1-532-509-XX 6.3A (FOR U/C, PM)

F7 1-532-422-00 6.3A (FOR J)

F8 1-532-272-XX 5A (FOR U/C, PM)

F8 1-532-421-00 5A (FOR J)

## HP-5 BOARD

1-604-378-00 PRINTED CIRCUIT BOARD,  
HP-5

CN1 1-507-553-00 JACK "HEADPHONES"

RV1 1-228-218-00 VAR, CARBON 500x2

E D A D T C

# KY-9 (KY-14, DP-9)

Ref. No.	Parts No.	Description
<b>KY-9 BOARD</b>		
	A-6717-205-A	MOUNTED CIRCUIT BOARD, KY-9 (WITH KY-14, DP-9)
	1-604-347-00	PRINTED CIRCUIT BOARD, KY-14
	1-604-349-00	PRINTED CIRCUIT BOARD, DP-9
C3	1-102-108-00	CERAMIC 150PF 10% 50V
C4	1-102-119-00	CERAMIC 0.0015 10% 50V
C6	1-102-114-00	CERAMIC 470PF 10% 50V
C7	1-102-112-00	CERAMIC 330PF 10% 50V
C11	1-102-114-00	CERAMIC 470PF 10% 50V
C12	1-102-114-00	CERAMIC 470PF 10% 50V
C13	1-102-113-00	CERAMIC 390PF 10% 50V
C14	1-102-114-00	CERAMIC 470PF 10% 50V
C25	1-102-110-00	CERAMIC 220PF 10% 50V
CN4	1-560-454-00	40P
D2	8-719-904-55	GL-5HD5
D3	8-719-904-55	GL-5HD5
D4	8-719-904-55	GL-5HD5
D5	8-719-904-55	GL-5HD5
D6	8-719-904-55	GL-5HD5
D7	8-719-803-21	TLR321
D8	8-719-803-21	TLR321
D9	8-719-803-21	TLR321
D10	8-719-803-21	TLR321
IC1	8-759-900-05	SN74LS05N (TI)
IC2	8-759-171-05	μPC7805H (NEC)
IC3	8-759-645-17	M54517P (MITSUBISHI)
IC4	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC5	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC6	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC7	8-759-241-61	TC40161BP (CD40161BE; RCA)
IC8	8-759-045-84	MC14584BCP (MOTOROLA)
IC9	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC10	8-759-240-15	TC4015BP (CD4015BE; RCA)
IC11	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC12	8-759-245-16	TC4516BP (MC14516BCP; MOT)
IC13	8-759-245-28	TC4528BP (MC14528BCP; MOT)
IC14	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC15	8-759-240-13	TC4013BP (CD4013BE; RCA)

Ref. No.	Parts No.	Description
IC16	8-759-240-13	TC4013BP (CD4013BE; RCA)
IC17	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC18	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC19	8-759-045-84	MC14584BCP (MOTOROLA)
IC20	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC21	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC22	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC23	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC24	8-759-645-17	M54517P (MITSUBISHI)
IC25	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC26	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC27	8-759-645-17	M54517P (MITSUBISHI)
IC28	8-759-645-17	M54517P (MITSUBISHI)
IC29	8-759-901-56	SN74LS156N (TI)
IC31	8-759-100-64	μPA64H (NEC)
IC32	8-759-100-54	μPA54H (NEC)
IC33	8-759-100-54	μPA54H (NEC)
IC34	8-759-100-64	μPA64H (NEC)
PL1	1-518-386-00	5V, 30mA
PL2	1-518-386-00	5V, 30mA
PL3	1-518-386-00	5V, 30mA
Q1	8-729-374-02	2SB740
Q2	8-729-374-02	2SB740
Q3	8-729-374-02	2SB740
Q4	8-729-374-02	2SB740
Q5	8-729-374-02	2SB740
Q6	8-729-374-02	2SB740
Q7	8-729-374-02	2SB740
Q8	8-729-374-02	2SB740
R1	1-212-502-00	METAL 51 1% 1/2W
R2	1-212-502-00	METAL 51 1% 1/2W
R3	1-212-502-00	METAL 51 1% 1/2W
R4	1-212-502-00	METAL 51 1% 1/2W
R42	1-212-502-00	METAL 51 1% 1/2W
R43	1-212-502-00	METAL 51 1% 1/2W
R44	1-212-502-00	METAL 51 1% 1/2W
R45	1-212-502-00	METAL 51 1% 1/2W
R46	1-212-502-00	METAL 51 1% 1/2W
R47	1-212-502-00	METAL 51 1% 1/2W

E. PARTS

Ref. No.	Parts No.	Description
R48	1-212-502-00	METAL 51 1% 1/2W
R49	1-212-502-00	METAL 51 1% 1/2W
R50	1-212-502-00	METAL 51 1% 1/2W
R51	1-212-502-00	METAL 51 1% 1/2W
R52	1-212-502-00	METAL 51 1% 1/2W
R53	1-212-502-00	METAL 51 1% 1/2W
R54	1-212-502-00	METAL 51 1% 1/2W
R55	1-212-502-00	METAL 51 1% 1/2W
R56	1-212-502-00	METAL 51 1% 1/2W
S1	1-554-318-11 1-518-450-31 3-706-480-01	KEY "ASSEMBLE" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S2	1-554-318-11 1-518-450-31 3-706-480-01	KEY "VIDEO INS" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S3	1-554-318-11 1-518-450-31 3-706-480-01	KEY "AUDIO 1 INS" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S4	1-554-318-11 1-518-450-31 3-706-480-01	KEY "AUDIO 2 INS" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S5	1-554-318-11 1-518-450-31 3-706-480-01	KEY "PREROLL" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S6	1-554-318-11 1-518-450-31 3-706-480-01	KEY "PREVIEW" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S7	1-554-318-21 1-518-450-31 3-706-480-11	KEY "AUTO EDIT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (RED)
S8	1-554-318-11 1-518-450-31 3-706-480-01	KEY "REVIEW" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S9	1-554-318-11 1-518-450-31 3-706-480-01	KEY "IN" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S10	1-554-318-11 1-518-450-31 3-706-480-01	KEY "OUT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S11	1-554-318-11 1-518-450-31 3-706-480-01	KEY "STANDBY" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S12	1-553-551-21 1-518-450-21 3-706-481-11	KEY "REC" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (RED)
S13	1-554-318-11 1-518-450-31 3-706-480-01	KEY "EDIT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S14	1-554-318-31 1-518-450-31 3-706-480-21	KEY "EJECT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (BLUE)
S15	1-553-551-11 1-518-450-21 3-706-481-01	KEY "REW" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)

Ref. No.	Parts No.	Description
S16	1-553-551-11 1-518-450-21 3-706-481-01	KEY "PLAY" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S17	1-553-551-11 1-518-450-21 3-706-481-01	KEY "FF" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S18	1-553-551-32 1-518-450-21 3-706-481-21	KEY "STOP" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (BLUE)
S19	1-554-318-11 1-518-450-31 3-706-480-01	KEY "SEARCH" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S20	1-516-994-00	LEVER SLIDE "VIDEO"
S21	1-552-539-00	KEY "TRIM -"
S22	1-552-539-00	KEY "TRIM +"
S23	1-552-539-00	KEY "ENTRY"
S24	1-552-539-00	KEY "LAP"
S25	1-552-539-00	KEY "RESET"
S26	1-552-539-00	KEY "PLAYER"
S27	1-552-539-00	KEY "RECORDER"
LV-1 BOARD		
	1-604-371-00	PRINTED CIRCUIT BOARD, LV-1
S1	1-516-994-00	LEVER SLIDE "VIDEO LEVEL"
MB-9 BOARD		
	A-6728-238-A	MOUNTED CIRCUIT BOARD, MB-9
CN51	1-561-654-00	86P
CN52	1-561-654-00	86P
CN53	1-555-700-00	WIRE ASS'Y, FLAT 34P (370mm)
CN54	1-560-547-00	40P

# MB-36, MD-15

Ref. No. Parts No. Description

## MB-36 BOARD

	A-6728-481-A	MOUNTED CIRCUIT BOARD, MB-36 (S/N Up to 10745 (U/C)) S/N Up to 10200 (J)
	A-6728-481-B	MOUNTED CIRCUIT BOARD, MB-36 (S/N 10746 and higher (U/C)) S/N 10201 and higher (J)
CN111	1-561-654-00	86P
CN112	1-561-654-00	86P
CN113	1-561-654-00	86P
CN114	1-561-654-00	86P
CN115	1-561-654-00	86P
CN116	1-561-654-00	86P
CN117	1-561-654-00	86P
CN142	1-564-773-11	40P

Ref. No. Parts No. Description

DL1	1-415-096-00	0.3μS (S/N. up to 11195 (U/C)) S/N. up to 10400 (J)
DL1	1-415-096-31	0.3μS (S/N. 11196 and higher (U/C)) S/N. 10401 and higher (J)
FL1	1-231-994-00	LOW PASS
FL3	1-231-580-00	HIGH-PASS (S/N. up to 11195 (U/C)) S/N. up to 10400 (J)
FL3	1-231-580-21	HIGH-PASS (S/N. 11196 and higher (U/C)) S/N. 10401 and higher (J)
FL4	1-231-578-00	LOW PASS (S/N. up to 11195 (U/C)) S/N. up to 10400 (J)
FL4	1-231-578-21	LOWPASS (S/N. 11196 and higher (U/C)) S/N. 10401 and higher (J)

## MD-15 BOARD

	A-6711-305-A	MOUNTED CIRCUIT BOARD, MD-15
C29	1-123-299-00	ELECT 1000 20% 6.3V
C34	1-102-522-00	CERAMIC 51PF 5% 50V
C35	1-109-683-00	MICA 270PF 1% 500V
C36	1-109-555-00	MICA 560PF 5% 100V
C59	1-102-503-00	CERAMIC 3PF CJ 50V
C60	1-102-513-00	CERAMIC 18PF CH 5% 50V
C90	1-102-514-00	CERAMIC 22PF CH 5% 50V
C91	1-102-529-00	CERAMIC 100PF CH 5% 50V
C92	1-102-706-00	CERAMIC 200PF SH 5% 50V
C207	1-102-529-00	CERAMIC 100PF CH 5% 50V
C244	1-102-529-00	CERAMIC 100PF CH 5% 50V
C501	1-109-561-00	MICA 0.001 5% 100V
C502	1-109-561-00	MICA 0.001 5% 100V
C503	1-109-561-00	MICA 0.001 5% 100V
C504	1-109-561-00	MICA 0.001 5% 100V
C506	1-109-561-00	MICA 0.001 5% 100V
C505	1-109-561-00	MICA 0.001 5% 100V

CV1 1-141-167-00 TRIMMER, 2.5PF ~ 18PF

D5	8-719-709-25	1S1925-P
D6	8-719-709-25	1S1925-P

IC1	8-751-300-00	CX-130 (SONY)
IC2	8-743-890-00	BX-389 (SONY)
IC3	8-759-270-60	TA7060P (TOSHIBA)
IC4	8-751-310-00	CX-131A (SONY)
IC5	8-751-300-00	CX-130 (SONY)
IC6	8-751-330-00	CX-133A (SONY)
IC7	8-751-300-00	CX-130 (SONY)
IC10	8-749-909-15	BX-3915A (SONY)
IC12	8-743-890-00	BX-389 (SONY)
IC13	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC501	8-759-045-38	MC14538BCP (MOTOROLA)
IC502	8-759-240-15	TC4015BP (CD4015BE; RCA)
IC503	8-759-045-38	MC14538BCP (MOTOROLA)
IC504	8-759-240-13	TC4013BP (TOSHIBA)
IC505	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC506	8-759-240-23	TC4023BP (CD4023BE; RCA)
IC507	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC508	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC509	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC510	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC511	8-759-045-38	MC14538BCP (MOTOROLA)

L10	1-407-167-61	MICRO 68μH
L11	1-407-166-61	MICRO 56μH

LV1 1-407-566-00 VAR, 3.3

Q1	8-724-375-01	2SC403C
Q3	8-729-201-04	2SC2878
Q4	8-724-375-01	2SC403C
Q5	8-729-201-04	2SC2878
Q6	8-724-375-01	2SC403C

# MD-15, MF-1, MS-5, PC-7, PC-8, PC-9

Ref. No.	Parts No.	Description
Q7	8-729-384-48	2SA844
Q8	8-724-375-01	2SC403C
Q9	8-724-375-01	2SC403C
Q10	8-724-375-01	2SC403C
Q12	8-724-375-01	2SC403C
Q18	8-724-375-01	2SC403C
Q19	8-724-375-01	2SC403C
Q20	8-724-375-01	2SC403C
Q25	8-724-375-01	2SC403C
Q26	8-724-375-01	2SC403C
Q27	8-724-375-01	2SC403C
Q201	8-724-375-01	2SC403C
Q202	8-724-375-01	2SC403C
Q203	8-724-375-01	2SC403C
Q204	8-729-113-32	2SB733
Q205	8-724-375-01	2SC403C
Q300	8-729-612-77	2SA1027R
Q301	8-724-375-01	2SC403C
Q302	8-729-612-77	2SA1027R
R10	1-244-850-00	CARBON 110 1/2W 5%
R64	1-244-850-00	CARBON 110 1/2W 5%
R89	1-244-850-00	CARBON 110 1/2W 5%
RV4	1-224-250-XX	VAR, METAL 2.2K
RV5	1-224-251-XX	VAR, METAL 4.7K
RV6	1-224-250-XX	VAR, METAL 2.2K
RV7	1-224-251-XX	VAR, METAL 4.7K
RV8	1-224-248-XX	VAR, METAL 470
RV13	1-224-254-XX	VAR, METAL 47K
RV14	1-224-250-XX	VAR, METAL 2.2K
RV15	1-224-250-XX	VAR, METAL 2.2K
RV16	1-224-550-21	VAR, METAL 220
RV501	1-224-256-XX	VAR, METAL 220K
RV502	1-224-256-XX	VAR, METAL 220K
RV504	1-224-134-XX	VAR, METAL 470K
S1	1-552-509-00	DIP "LINE DUB"
T1	1-411-100-00	BPT-1
T2	1-425-785-00	BAT
TH1	1-800-200-00	S-3K
X1	1-527-376-00	OSC. 3.579545MHz
X2	1-527-377-00	OSC. 4.267919MHz

Ref. No.	Parts No.	Description
<b>MF-1 BOARD</b>		
	1-604-365-00	PRINTED CIRCUIT BOARD, MF-1
<b>MS-5 BOARD</b>		
	1-604-368-00	PRINTED CIRCUIT BOARD, MS-5
D1	8-719-200-02	10E2 (ON THE MS-5(D))
S1	1-516-994-00	LEVER SLIDE FOR MS-5(A) "AUDIO LIMITER" FOR MS-5(D) "DUB/LINE" FOR MS-5(E) "LOCAL/REMOTE"
	1-516-995-00	LEVER SLIDE FOR MS-5(B) "MIXING SELECT" FOR MS-5(C) "MODE SELECT" FOR MS-5(F) "DT SELECT"
<b>PC-7 BOARD</b>		
	1-604-348-00	PRINTED CIRCUIT BOARD, PC-7
IC1	8-719-104-42	PS4005-L (NEC)
<b>PC-8 BOARD</b>		
	A-6742-046-A	MOUNTED CIRCUIT BOARD, PC-8
<b>NOTE:</b>		
D1 and Q1 are precisely calibrated their physical position on PC-8 board in the factory by precision fixture. Do not replace only D1 or Q1. Replace the entire PC-8 mounted A-6742-046-A.		
<b>PC-9 BOARD</b>		
	1-604-351-00	PRINTED CIRCUIT BOARD, PC-9
IC1	8-759-133-90	μPC339C (NEC)
IC2	8-719-140-05	PS4005 (NEC)
IC3	8-719-140-05	PS4005 (NEC)
IC4	8-719-140-05	PS4005 (NEC)

E. PARTS

# PC-12, PC-14, PD-19 (PD-15, PD-17, PD-21, DR-9, DR-19, BP-6)

Ref. No.      Parts No.      Description

## PC-12 BOARD

A-6742-047-A      MOUNTED CIRCUIT BOARD  
PC-12

### NOTE:


D1 and Q1 are precisely calibrated their physical position on PC-12 board in the factory by precision fixture. Do not replace only D1 or Q1. Replace the entire PC-12 mounted A-6742-047-A.


## PC-14 BOARD

1-604-353-00      PRINTED CIRCUIT BOARD,  
PC-14

IC1      8-719-104-42      PS4005-L (NEC)

## PD-19 BOARD

 MOUNTED CIRCUIT BOARD,  
PD-19 (WITH PD-15, PD-17, PD-21,  
DR-9, DR-19, BP-6)  
(S/N. Up to (U/C: 10745, J: 10200))  
(S/N. Up to 10005 (PM))

 MOUNTED CIRCUIT BOARD,  
PD-19 (WITH PD-15, PD-17, PD-21,  
DR-9, DR-19)  
(S/N; (U/C: 10746, J: 10201) and higher)  
(S/N; 10006 and higher (PM))

1-560-035-00      B to B, 5P  
1-604-361-00      PRINTED CIRCUIT BOARD, PD-15  
1-604-362-00      PRINTED CIRCUIT BOARD, PD-17  
1-604-369-00      PRINTED CIRCUIT BOARD, DR-9  
1-607-270-00      PRINTED CIRCUIT BOARD, DR-19  
1-608-010-00      PRINTED CIRCUIT BOARD, PD-21

1-608-478-00      PRINTED CIRCUIT BOARD, BP-6  
(S/N. Up to (U/C: 10745, J: 10200))  
(S/N. Up to 10005 (PM))

C101      1-109-577-00      MICA 680PF 5% 500V  
C201      1-109-577-00      MICA 680PF 5% 500V  
C332      (1-109-582-00      MICA 0.0011 5% 500V  
1-109-587-00      MICA 0.0018 5% 500V  
C365      1-161-025-00      CERAMIC 0.1 25V

CP301      1-464-139-00      OSC.

Ref. No.      Parts No.      Description

D53      8-719-900-95      V09G  
D54      8-719-900-95      V09G  
D55      8-719-900-95      V09G  
D56      8-719-900-95      V09G  
D301      8-719-151-07      RD5.1E-B

D302      8-719-911-55      U05G  
D305      8-759-112-88      RD12F-B  
D306      8-719-133-07      RD3.3E-B  
D311      8-719-200-02      10E-2  
D312      8-719-113-07      RD13E-B

D313      8-719-113-07      RD13E-B  
D314      8-719-200-02      10E-2

IC101      8-759-145-58       $\mu$ PC4558C (RC4558; RAYTHEON)  
IC301      8-759-145-58       $\mu$ PC4558C (RC4558; RAYTHEON)  
IC303      8-759-979-12       $\mu$ A7912UC (FSC)  
IC304      8-759-145-58       $\mu$ PC4558C (RC4558; RAYTHEON)  
IC305      8-759-645-17      M54517P (MITSUBISHI)

Q52      8-729-384-48      2SA844  
Q53      8-763-420-00      2SC1762  
Q54      8-765-141-00      2SA911  
Q101      8-765-141-00      2SA911  
Q102      8-765-141-00      2SA911

Q103      8-763-420-00      2SC1762  
Q104      8-763-420-00      2SC1762  
Q105      8-763-420-00      2SC1762  
Q106      8-763-420-00      2SC1762  
Q107      8-763-420-00      2SC1762

Q108      8-765-141-00      2SA911  
Q109      8-765-141-00      2SA911  
Q110      8-765-141-00      2SA911  
Q112      8-729-384-48      2SA844  
Q201      8-765-141-00      2SA911

Q202      8-765-141-00      2SA911  
Q203      8-763-420-00      2SC1762  
Q204      8-763-420-00      2SC1762  
Q205      8-763-420-00      2SC1762  
Q206      8-763-420-00      2SC1762

Q207      8-763-420-00      2SC1762  
Q208      8-765-141-00      2SA911  
Q209      8-765-141-00      2SA911  
Q210      8-765-141-00      2SA911  
Q212      8-729-384-48      2SA844

Q301      8-729-374-72      2SA747  
Q302      8-729-374-72      2SA747  
Q304      8-729-177-43      2SD774  
Q305      8-729-103-43      2SB734  
Q306      8-729-168-11      2SC2681

Ref. No.      Parts No.      Description

Q307      8-729-311-62      2SC1116  
Q308      8-729-177-43      2SD774  
Q309      8-729-103-43      2SB734  
Q310      8-729-168-11      2SC2681  
Q311      8-729-311-62      2SC1116

Q312      8-723-302-00      2SK43-2  
Q313      8-729-177-43      2SD774  
Q314      8-729-374-02      2SB740  
Q315      8-729-331-53      2SC2315  
Q317      8-729-377-12      2SA771

Q318      8-729-168-11      2SC2681  
Q319      8-729-168-11      2SC2681  
Q320      8-729-374-02      2SB740  
Q321      8-729-201-04      2SC2878  
Q323      8-729-374-02      2SB740

Q324      8-729-114-11      2SA1141  
Q325      8-729-177-43      2SD774  
Q326      8-729-168-11      2SC2681  
Q331      8-729-374-02      2SB740  
Q332      8-729-612-77      2SA1027R

Q333      8-729-612-77      2SA1027R  
Q336      8-729-374-02      2SB740  
Q340      8-729-612-77      2SA1027R  
Q341      8-729-374-02      2SB740  
Q342      8-729-177-43      2SD774

R6      1-217-159-00      METAL 0.68 5W 10%  
R13      1-217-159-00      METAL 0.68 5W 10%  
R53      1-247-224-00      CARBON 220 1/2W 5%  
R56      1-247-224-00      CARBON 220 1/2W 5%  
R109      1-244-925-00      CARBON 150K 1/2W 5%

R110      1-244-925-00      CARBON 150K 1/2W 5%  
R114      1-224-925-00      CARBON 150K 1/2W 5%  
R122      1-206-670-00      METAL 1.8K 2W 5%  
R209      1-244-925-00      CARBON 150K 1/2W 5%  
R210      1-244-925-00      CARBON 150K 1/2W 5%

R214      1-244-925-00      CARBON 150K 1/2W 5%  
R222      1-206-670-00      METAL 1.8K 2W 5%  
R311      1-207-619-00      WIREWOUND 0.82 3W 10%  
R326      1-212-372-11      METAL 10 1W 5%  
R328      1-213-131-00      METAL 100 1W 5%

R332      1-212-352-00      METAL 0.22 1W 5%  
R333      1-212-352-00      METAL 0.22 1W 5%

**A** R334      1-217-465-00      FUSIBLE 0.47 1W 10%

R350      1-213-131-00      METAL 100 1W 5%  
R372      1-247-180-00      CARBON 1 1/2W 5%  
R373      1-244-844-00      CARBON 62 1/2W 5%

RV1      1-224-249-XX      VAR, METAL 1K  
RV2      1-224-249-XX      VAR, METAL 1K

Ref. No.      Parts No.      Description

**PR-33 BOARD**

1-604-511-00      PRINTED CIRCUIT BOARD,  
PR-33

S1      1-516-994-00      LEVER SLIDE "REMOTE 1/2"

# PW-50 (S/N. up to 10745 (U/C) S/N. up to 10250 (J)/1005 (PM))

Ref. No.    Parts No.    Description  
**PW-50 BOARD** ----- [S/N. up to 10745 (U/C)  
S/N. up to 10250 (J)  
S/N. up to 10005 (PM)]

 **1-604-363-00**    PRINTED CIRCUIT BOARD,  
PW-50

 **1-533-037-XX**    HOLDER, FUSE

 **C1**    **1-130-160-00**    MYLAR 0.22 20% 250V

 **C2**    **1-161-744-00**    CERAMIC 0.01 400V

 **C3**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C4**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C5**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C6**    **1-161-743-00**    CERAMIC 0.0047 400V

**C7**    **1-125-250-00**    ELECT 3300 200V

**C8**    **1-125-250-00**    ELECT 3300 200V

 **C9**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C10**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C11**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C12**    **1-161-743-00**    CERAMIC 0.0047 400V

 **C13**    **1-161-744-00**    CERAMIC 0.01 400V

Ref. No.    Parts No.    Description

 **CN151**    **1-560-033-00**    3P

 **CN152**    **1-560-033-00**    3P

 **CN153**    **1-560-034-00**    6P

 **CN154**    **1-560-034-00**    6P

 **CN155**    **1-560-008-00**    3P

**D1**    **8-719-911-55**    U05G

**D2**    **8-719-911-55**    U05G

**D3**    **8-719-911-55**    U05G

**D4**    **8-719-911-55**    U05G

**D5**    **8-719-200-02**    10E-2

 **F1**    **1-532-579-00**    4A

 **F2**    **1-532-634-00**    10A, 150°C

 **R1**    **1-217-632-00**    WIREWOUND 10 10% 10W

**R3**    **1-244-929-00**    CARBON 220K 5% 1/2W

**R4**    **1-244-929-00**    CARBON 220K 5% 1/2W

 **RY1**    **1-515-357-00**    12V 75mA

 **T1**    **1-421-457-00**    LINE FILTER

E. PARTS



Ref. No. Parts No. Description

**PW-50 BOARD** ----- (S/N. 10746 and higher (U/C))  
S/N. 10251 and higher (J)  
S/N. 10006 and higher (PM)

**1-604-363-16** PRINTED CIRCUIT BOARD,  
PW-50 (S/N. 10746 to 11375 (U/C))  
S/N. 10251 to 10440 (J)  
S/N. 10006 to 10010 (PM)

**1-604-363-17** PRINTED CIRCUIT BOARD,  
PW-50 (S/N. 11376 and higher (U/C))  
S/N. 10441 and higher (J)  
S/N. 10011 and higher (PM)

**1-517-072-00** HOLDER, FUSE

**C1** 1-136-185-00 MYLAR 0.22 20% 250V

**C2** 1-136-210-00 MYLAR 0.01 20% 250V

**C3** 1-161-741-00 CERAMIC 0.001 10% 400V

**C4** 1-161-741-00 CERAMIC 0.001 10% 400V

**C5** 1-161-741-00 CERAMIC 0.001 10% 400V

**C6** 1-161-741-00 CERAMIC 0.001 10% 400V

**C7** 1-125-250-00 ELECT 3300 200V

**C8** 1-125-250-00 ELECT 3300 200V

**C9** 1-161-953-00 CERAMIC 0.0047 20% 400V

**C10** 1-161-953-00 CERAMIC 0.0047 20% 400V

**C11** 1-161-953-00 CERAMIC 0.0047 20% 400V

**C12** 1-161-953-00 CERAMIC 0.0047 20% 400V

**C13** 1-136-210-00 MYLAR 0.01 20% 250V

**C14** 1-131-371-00 TANTALUM 10 16V

Ref. No. Parts No. Description

**CN151** 1-560-033-00 3P

**CN152** 1-560-033-00 3P

**CN153** 1-560-034-00 6P

**CN154** 1-560-034-00 6P (S/N. up to 11375 (U/C))  
S/N. up to 10440 (J)  
S/N. up to 10010 (PM)

**D1** 8-719-911-55 U05G  
**D2** 8-719-911-55 U05G  
**D3** 9-719-911-55 U05G  
**D4** 8-719-911-55 U05G  
**D5** 8-719-200-02 10E-2  
**D6** 8-719-815-55 1S1555

**F1** 1-532-713-00 3A

**F2** 1-532-634-00 10A, 150°C

**PH1** 1-519-244-00 NEON PHOTO COUPLER

**Q1** 8-729-663-47 2SC1364  
**Q2** 8-729-177-43 2SD774

**R1** 1-217-632-00 WIREWOUND 10 10% 10W

**R3** 1-244-929-00 CARBON 220K 5% 1/2W

**R4** 1-244-929-00 CARBON 220K 5% 1/2W

**R5** 1-247-276-00 CARBON, NONFLAMABLE  
33K 5% 1/2W

**R11** 1-247-266-00 CARBON, NONFLAMABLE  
12K 5% 1/2W

**R12** 1-247-284-00 CARBON, NONFLAMABLE  
68K 5% 1/2W

**R13** 1-247-286-00 CARBON, NONFLAMABLE  
82K 5% 1/2W

(S/N. 11376 and higher (U/C))  
S/N. 10441 and higher (J)  
S/N. 10011 and higher (PM)

**RY1** 1-515-493-00 12V 75mA

**T1** 1-421-457-00 LINE FILTER

# PW-79 (FU-13) (S/N. up to 10745 (U/C) S/N. up to 10250 (J)/10005 (PM))

Ref. No.	Parts No.	Description
PW-79 BOARD -----	(S/N. up to 10745 (U/C))	
	(S/N. up to 10250 (J))	
	(S/N. up to 10005 (PM))	
	1-413-071-00	SWITCHING REGULATOR (WITH PW-79, FU-13)
	1-517-072-00	HOLDER, FUSE
	1-604-556-00	PRINTED CIRCUIT BOARD "FU-13"

Ref. No.	Parts No.	Description
D11	8-719-912-52	ESAC25-02C
D12	8-719-924-06	ERC24-06S
D13	8-719-924-06	ERC24-06S
D14	8-719-156-25	RD5.6E-B2Z
D15	8-719-151-07	RD5.1E-B
D16	9-982-876-01	SCR, SF5G41

F1	9-982-878-01	THERMAL, 2A 120V 147degrees
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C1	9-982-833-01	MYLAR 0.22 630V
C2	1-161-734-00	CERAMIC 0.0022 20% 400V
C3	1-161-734-00	CERAMIC 0.0022 20% 400V
C4	9-982-837-01	ELECT 22 400V
C5	1-130-141-00	MYLAR 0.01 20% 30V

C6	9-982-832-01	CERAMIC 0.001 500V
C7	9-982-835-01	MYLAR 0.47 50V
C8	1-108-579-00	MYLAR 0.01 5% 50V
C10	1-108-571-00	MYLAR 0.047 5% 50V
C11	9-982-836-01	MYLAR 0.068 50V

C13	9-982-840-01	ELECT 47 350V
C14	1-130-356-00	MYLAR 0.47 10% 250V
C15	1-130-356-00	MYLAR 0.47 10% 250V
C25	9-982-844-01	ELECT 10 250V
C26	9-982-844-01	ELECT 10 250V

C27	9-982-844-01	ELECT 10 250V
C28	9-982-844-01	ELECT 10 250V
C29	9-982-844-01	ELECT 10 250V
C30	9-982-844-01	ELECT 10 250V
C31	9-982-834-01	MYLAR 2.2 250V

C32	1-161-734-00	CERAMIC 0.0022 20% 400V
C33	1-161-734-00	CERAMIC 0.0022 20% 400V
C34	9-982-834-01	MYLAR 2.2 250V
C36	1-108-579-00	MYLAR 0.01 5% 50V

D1	8-719-303-41	S-34
D2	8-719-815-80	1S1587
D3	8-719-815-80	1S1587
D4	8-719-815-80	1S1587
D5	8-719-815-80	1S1587

D6	8-719-815-80	1S1587
D7	8-719-815-80	1S1587
D8	8-719-912-52	ESAC25-02C
D9	8-719-912-52	ESAC25-02C
D10	8-719-912-50	ESAC25-02N

IC1	8-759-729-03	NJM2903D (JRC)
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L1	1-421-349-00	FILTER, LINE
L2	1-421-329-00	10
L4	1-421-348-00	6.5mH
L5	9-982-877-01	20
L6	9-982-877-01	20

L7	9-982-877-01	20
L8	9-982-877-01	20
L9	9-982-877-01	20
L10	9-982-877-01	20
L11	1-421-329-00	10

L12	1-421-329-00	10
L13	1-421-329-00	10
L14	1-421-329-00	10
L15	1-421-329-00	10

Q1	8-729-950-40	ETD55-040B
Q2	8-729-950-40	ETD55-040B
Q3	8-763-623-00	2SC1810
Q4	8-765-141-00	2SA911
Q5	8-763-623-00	2SC1810

Q6	8-729-612-77	2SA1027R
Q7	8-729-612-77	2SA1027R
Q8	8-729-612-77	2SA1027R
Q9	8-729-663-47	2SC1364
Q10	8-729-965-61	2SC2656

Q11	8-729-663-47	2SC1364
Q12	8-729-965-61	2SC2656




E. PARTS

Ref. No.	Parts No.	Description
R1	1-211-514-00	CARBON, NONFLAMMABLE 47 1/4W 5%
R2	1-211-520-00	CARBON, NONFLAMMABLE 82 1/4W 5%
R3	1-211-518-00	CARBON, NONFLAMMABLE 68 1/4W 5%
R4	1-211-528-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R5	1-206-698-00	METAL 27K 2W 5%
R6	1-206-698-00	METAL 27K 2W 5%
R7	1-206-698-00	METAL 27K 2W 5%
R8	1-206-698-00	METAL 27K 2W 5%
R9	1-214-595-00	METAL 100K 1W 5%
R10	1-214-597-00	METAL 100K 2W 5%
R11	1-214-998-00	METAL 100K 1W 5%
R12	1-211-553-00	CARBON, NONFLAMMABLE 2.7K 1/4W 5%
R14	1-211-526-00	CARBON, NONFLAMMABLE 150 1/4W 5%
R16	1-211-528-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R18	1-211-553-00	CARBON, NONFLAMMABLE 2.7K 1/4W 5%
R24	1-211-520-00	CARBON, NONFLAMMABLE 82 1/4W
R25	1-217-160-00	CEMENT 1 5W
R26	9-982-828-01	METAL 68 1W
R27	9-982-830-01	PC 100 3W
R29	1-214-595-00	METAL 100K 1W 5%
R30	1-214-595-00	METAL 100K 1W 5%
R31	9-982-829-01	METAL 0.68 1W 5%
R32	9-982-829-01	METAL 0.68 1W 5%
R37	1-244-869-00	CARBON 680 1/2W 5%
RV1	9-982-831-01	METAL, VAR 1K 1/2W
RV2	9-982-831-01	METAL, VAR 1K 1/2W
T1	1-543-100-00	DRIVE
T2	1-543-100-00	DRIVE
T3	1-446-982-00	CONVERTER

# PW-79 (FU-13) (S/N. 10746 (U/C)/10006 (PM) and higher) (S/N. 10251 and higher (J))

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
PW-79 BOARD	(S/N. 10746 and higher (U/C)) (S/N. 10251 and higher (J)) (S/N. 10006 and higher (PM))		F1	9-982-878-01	THERMAL, 2A 120V 147degrees
	1-413-071-14	SWITCHING REGULATOR (WITH PW-79, FU-13)	IC1	8-759-729-03	NJM2903D (JRC)
	1-517-072-00	HOLDER, FUSE	L1	1-421-349-00	FILTER, LINE
	1-604-556-14	PRINTED CIRCUIT BOARD "FU-13"	L2	1-421-329-00	10
	1-604-555-14	PRINTED CIRCUIT BOARD "PW-79"	L3	1-407-161-XX	22
			L4	9-983-537-01	5mH
C1	9-982-833-01	MYLAR 0.22 630V	L5	9-982-877-01	20
			L6	9-982-877-01	20
C2	1-161-742-00	CERAMIC 0.0022 20% 400V	L7	9-982-877-01	20
			L8	9-982-877-01	20
C3	1-161-742-00	CERAMIC 0.0022 20% 400V	L9	9-982-877-01	20
			L10	9-982-877-01	20
C4	9-982-837-01	ELECT 22 400V	L11	1-421-329-00	10
C5	1-130-141-00	MYLAR 0.01 20% 30V	L12	1-421-329-00	10
			L13	1-421-329-00	10
C6	9-982-832-01	CERAMIC 0.001 500V	L14	1-421-329-00	10
C7	9-982-835-01	MYLAR 0.47 50V	L15	1-421-329-00	10
C8	1-108-579-00	MYLAR 0.01 5% 50V			
C10	1-108-571-00	MYLAR 0.047 5% 50V	Q1	8-729-965-61	2SC2656
C11	9-982-836-01	MYLAR 0.068 50V	Q2	8-729-965-61	2SC2656
			Q3	8-729-954-21	2SC2542
C13	9-982-840-01	ELECT 47 350V	Q4	8-729-100-93	2SA1009A
C14	1-130-356-00	MYLAR 0.47 10% 250V	Q5	8-763-623-00	2SC1810
C15	1-130-356-00	MYLAR 0.47 10% 250V			
C25	9-982-844-01	ELECT 10 250V	Q6	8-729-173-37	2SA733
C26	9-982-844-01	ELECT 10 250V	Q7	8-729-173-37	2SA733
			Q8	8-729-612-77	2SA1027R
C27	9-982-844-01	ELECT 10 250V	Q9	8-729-389-09	2SC1890
C28	9-982-844-01	ELECT 10 250V	Q10	8-729-965-61	2SC2656
C29	9-982-844-01	ELECT 10 250V			
C30	9-982-844-01	ELECT 10 250V	Q11	8-729-663-47	2SC1364
C31	9-982-834-01	MYLAR 2.2 250V	Q12	8-729-965-61	2SC2656
C32	1-161-741-00	CERAMIC 0.001 20% 400V	R1	1-247-099-00	CARBON, NONFLAMMABLE 47 1/4W 5%
			R2	1-247-105-00	CARBON, NONFLAMMABLE 82 1/4W 5%
C33	1-161-741-00	CERAMIC 0.001 20% 400V	R3	1-247-103-00	CARBON, NONFLAMMABLE 68 1/4W 5%
			R4	1-247-113-00	CARBON, NONFLAMMABLE 180 1/4W 5%
C34	9-982-834-01	MYLAR 2.2 250V	R5	9-983-524-01	METAL 27K 3W 5%
C36	1-108-579-00	MYLAR 0.01 5% 50V			
D1	1-806-262-51	CTU-26S			
D3	8-719-903-29	ERB43-04			
D4	8-719-815-87	1S1587			
D5	8-719-815-87	1S1587			
D6	8-719-815-87	1S1587			
D7	8-719-815-87	1S1587			
D8	9-983-533-01	ESAC87-009			
D9	8-719-903-16	ESAC85-009			
D10	8-719-903-16	ESAC85-009			
D11	8-719-924-06	ERC24-06S			
D12	8-719-924-06	ERC24-06S			

E. PARTS

Ref. No.	Parts No.	Description
R6	9-983-524-01	METAL 27K 3W 5%
R7	9-983-524-01	METAL 27K 3W 5%
R8	9-983-524-01	METAL 27K 3W 5%
R9	9-983-525-01	METAL 100K 2W 5%
R10	9-983-526-01	METAL 100K 3W 5%
R11	1-214-998-00	METAL 100K 1W 5%
R12	1-247-140-00	CARBON, NONFLAMMABLE 2400 1/4W 5%
R13	1-247-131-00	CARBON, NONFLAMMABLE 1K 1/4W 5%
R14	1-247-113-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R16	1-247-113-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R18	1-247-141-00	CARBON, NONFLAMMABLE 2.7K 1/4W 5%
R19	1-247-127-00	CARBON, NONFLAMMABLE 680 1/4W 5%
R24	1-247-127-00	CARBON, NONFLAMMABLE 680 1/4W 5%
 R25	1-217-160-00	CEMENT 1 5W
R26	9-983-527-01	METAL 68 1W
R27	9-982-830-01	PC 100 3W
R29	9-983-525-01	METAL 100K 2W 5%
R30	9-983-525-01	METAL 100K 2W 5%
R31	9-982-829-01	METAL 0.68 1W 5%
R32	9-982-829-01	METAL 0.68 1W 5%
R37	1-247-236-00	CARBON 680 1/2W 5%
R39	9-983-528-01	METAL 4700K 1/4W
R40	1-213-151-00	METAL 6800 2W
R41	1-213-151-00	METAL 6800 2W
R42	1-213-151-00	METAL 6800 2W
R43	1-213-151-00	METAL 6800 2W
 R44	1-217-158-00	METAL 0.47 5W
RV1	9-982-831-01	METAL, VAR 1K 1/2W
RV2	9-982-831-01	METAL, VAR 1K 1/2W
SCR1	8-719-801-42	SCR, SFOR1G42
SCR2	9-983-536-01	SCR, CR6AM
T1	1-437-148-00	DRIVE
T2	1-543-100-00	DRIVE
 T3	1-447-708-00	CONVERTER
T4	9-983-538-01	STEP-UP
ZD1	8-719-151-07	RD5.1EB
ZD2	8-719-151-07	RD5.1EB

# RE-3, RL-14, RM-4, RP-10

E. PARTS

Ref. No. Parts No. Description

## RE-3 BOARD

\*1 A-6725-227-A MOUNTED CIRCUIT BOARD,  
RE-3  
\*2 A-6725-227-B MOUNTED CIRCUIT BOARD,  
RE-3

D7 8-719-200-02 10E-2  
D8 8-719-200-02 10E-2

IC1 \*1 8-759-308-07 HA 1807 (HITACHI)  
\*2 8-759-729-03 NJM2903D (JRC)  
IC2 \*2 8-759-729-03 NJM2903D (JRC)  
R3 1-212-526-00 METAL 510 1% 1/2W  
R4 1-212-533-00 METAL 1K 1% 1/2W  
R13 1-217-156-00 METAL 0.22 10% 5W  
R15 1-217-156-00 METAL 0.22 10% 5W

RV1 \*1 1-224-253-XX VAR, METAL 22K  
RV2 1-224-247-XX VAR, METAL 100  
RV3 1-224-247-XX VAR, METAL 100

NOTE: \*1: (Serial No. 10,001 to 10,050 (J))  
(Serial No. 10,001 to 10,100 (U/C))  
\*2: (Serial No. 10,051 and higher (J))  
(Serial No. 10,101 and higher (U/C))  
(Serial No. 10,001 and higher (PM))

RL-14 BOARD----- (S/N. up to 10745 (U/C))  
(S/N. up to 10250 (J))  
(S/N. up to 10005 (PM))  
1-606-043-00 PRINTED CIRCUIT BOARD,  
RL-14

PH1 1-519-244-00 NEON PHOTO COUPLER

Q2 8-729-177-43 2SD774

## RM-4 BOARD

1-604-370-00 PRINTED CIRCUIT BOARD,  
RM-4

CN101 1-561-028-00 36P "REMOTE 2"  
CN102 1-561-655-00 9P "REMOTE 1"  
CN103 1-564-466-11 34P

Ref. No. Parts No. Description

## RP-10 BOARD

A-6711-308-A MOUNTED CIRCUIT BOARD,  
RP-10

D1 8-719-815-59 1S1555-S  
D2 8-719-127-07 RD2.7E-B

IC1 8-743-731-00 BX-373A (SONY)  
IC2 8-759-240-09 TC4009UBP (CD4009UBE; RCA)  
IC3 8-743-500-00 BX-350 (SONY)  
IC4 8-743-500-00 BX-350 (SONY)  
IC5 8-751-300-00 CX-130 (SONY)  
IC6 8-751-300-00 CX-130 (SONY)  
IC7 8-729-677-14 2SC2771 (MITSUBISHI)  
IC8 8-729-677-14 2SC2771 (MITSUBISHI)  
IC101 8-759-240-13 TC4013BP (CD4013BE; RCA)

Q3 8-729-201-04 2SC2878  
Q6 8-729-201-04 2SC2878  
Q7 8-724-375-01 2SC403C  
Q8 8-724-375-01 2SC403C  
Q9 8-724-375-01 2SC403C

Q10 8-724-375-01 2SC403C  
Q51 8-729-612-77 2SA1027R  
Q52 8-729-612-77 2SA1027R  
Q101 8-724-375-01 2SC403C  
Q102 8-724-375-01 2SC403C

Q103 8-724-375-01 2SC403C  
Q104 8-724-375-01 2SC403C  
Q105 8-724-375-01 2SC403C  
Q106 8-729-177-32 2SD773  
Q107 8-729-113-32 2SB733

Q108 8-724-375-01 2SC403C  
Q109 8-724-375-01 2SC403C  
Q110 8-729-177-32 2SD773  
Q111 8-729-113-32 2SB733

R29 1-244-850-00 CARBON 110 1/2W 5%  
R38 1-244-850-00 CARBON 110 1/2W 5%

RV1 1-224-249-XX VAR, METAL 1K  
RV2 1-224-248-XX VAR, METAL 470  
RV3 1-224-251-XX VAR, METAL 4.7K  
RV4 1-224-250-XX VAR, METAL 2.2K  
RV5 1-224-251-XX VAR, METAL 4.7K

Ref. No.	Parts No.	Description
RV6	1-224-250-XX	VAR, METAL 2.2K
RV7	1-224-249-XX	VAR, METAL 1K
RV8	1-224-249-XX	VAR, METAL 1K
RV9	1-224-248-XX	VAR, METAL 470
RV10	1-224-248-XX	VAR, METAL 470
RV101	1-224-249-XX	VAR, METAL 1K
RV102	1-224-249-XX	VAR, METAL 1K

T1	1-426-017-00	AF
T2	1-426-066-00	RF
T3	1-426-018-00	AF
T4	1-426-066-00	RF
T5	1-426-018-00	AF

T101	1-425-384-00	TL
T102	1-425-384-00	TL

## RS-3 BOARD

A-6715-112-A	MOUNTED CIRCUIT BOARD, RS-3 (WITH RS-4)
1-555-697-00	WIRE ASS'Y, FLAT 50P (25mm)
1-564-392-00	HEADER, 50P (ON THE RS-4)

C6	1-102-110-00	CERAMIC 220PF 10% 50V
C13	1-102-106-00	CERAMIC 100PF 10% 50V
C15	1-102-106-00	CERAMIC 100PF 10% 50V
C22	1-102-110-00	CERAMIC 220PF 10% 50V
C29	1-102-106-00	CERAMIC 100PF 10% 50V

C31	1-102-106-00	CERAMIC 100PF 10% 50V
C33	1-102-114-00	CERAMIC 470PF 10% 50V
C39	1-102-106-00	CERAMIC 100PF 10% 50V
C40	1-102-106-00	CERAMIC 100PF 10% 50V
C42	1-102-106-00	CERAMIC 100PF 10% 50V

C44	1-102-106-00	CERAMIC 100PF 10% 50V
C46	1-102-114-00	CERAMIC 470PF 10% 50V
C49	1-123-612-00	ELECT 2.2 50V
C50	1-102-106-00	CERAMIC 100PF 10% 50V
C52	1-102-106-00	CERAMIC 100PF 10% 50V
C53	1-102-106-00	CERAMIC 100PF 10% 50V

C54	1-102-106-00	CERAMIC 100PF 10% 50V
C56	1-102-106-00	CERAMIC 100PF 10% 50V
C57	1-102-106-00	CERAMIC 100PF 10% 50V
C101	1-102-114-00	CERAMIC 470PF 10% 50V
C502	1-102-106-00	CERAMIC 100PF 10% 50V

C503	1-102-106-00	CERAMIC 100PF 10% 50V
C504	1-102-106-00	CERAMIC 100PF 10% 50V
C506	1-102-106-00	CERAMIC 100PF 10% 50V
C510	1-102-106-00	CERAMIC 100PF 10% 50V
C511	1-102-106-00	CERAMIC 100PF 10% 50V

C512	1-102-106-00	CERAMIC 100PF 10% 50V
C514	1-102-106-00	CERAMIC 100PF 10% 50V
C517	1-102-106-00	CERAMIC 100PF 10% 50V
C519	1-102-106-00	CERAMIC 100PF 10% 50V
C521	1-102-106-00	CERAMIC 100PF 10% 50V
C523	1-102-106-00	CERAMIC 100PF 10% 50V
C531	1-102-106-00	CERAMIC 100PF 10% 50V
C534	1-102-106-00	CERAMIC 100PF 10% 50V
C542	1-102-106-00	CERAMIC 100PF 10% 50V
C545	1-102-106-00	CERAMIC 100PF 10% 50V

C598	1-102-114-00	CERAMIC 470PF 10% 50V
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D1	8-719-151-07	RD5.1E-B
D5	8-719-151-07	RD5.1E-B
D29	8-719-191-07	RD9.1E-B
D37	8-719-175-07	RD7.5E-B
D42	8-719-151-07	RD5.1E-B

D505	8-719-709-25	1S1925-P
D507	8-719-709-25	1S1925-P

IC1	8-759-729-03	NJM2903D (JRC)
IC2	8-759-729-03	NJM2903D (JRC)
IC3	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC4	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC5	8-759-240-13	TC4013BP (CD4013BE; RCA)

IC6	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC7	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC8	8-759-618-41	M51841P (NE555N; SIGNETICS)
IC9	8-759-618-41	M51841P (NE555N; SIGNETICS)
IC10	8-759-045-38	MC14538BCP (MOTOROLA)

IC11	8-759-132-40	μPC324C (LM324; NSC)
IC12	8-759-618-41	M51841P (NE555N; SIGNETICS)
IC13	8-759-132-40	μPC324C (LM324; NSC)
IC14	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC15	8-759-240-11	TC4011BP (CD4011BE; RCA)

IC16	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC17	8-759-132-40	μPC324C (LM324; NSC)
IC18	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC19	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC20	8-759-240-69	TC4069UBP (CD4069UBE; RCA)

IC21	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC22	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC23	8-759-645-17	M54517P (MITSUBISHI)
IC24	8-759-241-61	TC40161BP (CD40161BE; RCA)
IC25	8-759-240-99	TC4099BP (CD4099BE; RCA)

IC26	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC27	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC28	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC29	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC30	8-759-240-01	TC4001BP (CD4001BE; RCA)

IC31	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC32	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC33	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC34	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC35	8-759-240-69	TC4069UBP (CD4069UBE; RCA)

# RS-3 (RS-4)

## E. PARTS

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC36	8-759-240-11	TC4011BP (CD4011BE; RCA)	IC540	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC37	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC541	8-759-132-40	$\mu$ PC324C (LM324; NSC)
IC38	8-759-240-11	TC4011BP (CD4011BE; RCA)	IC542	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC39	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC543	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC40	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC544	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC41	8-759-250-67	TC5067BP (TOSHIBA)	IC545	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC42	8-759-645-19	M54519P (MITSUBISHI)	IC546	8-759-240-78	TC4078BP (CD4078BE; RCA)
IC43	8-759-250-67	TC5067BP (TOSHIBA)			
IC44	8-759-645-19	M54519P (MITSUBISHI)			
IC45	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q1	8-729-201-04	2SC2878
IC46	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q5	8-729-201-04	2SC2878
IC47	8-759-145-58	$\mu$ PC4558C (RC4558; RAYTHEON)	Q6	8-729-201-04	2SC2878
IC48	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q7	8-729-201-04	2SC2878
IC49	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q8	8-729-201-04	2SC2878
IC50	8-759-240-01	TC4001BP (CD4001BE; RCA)			
IC51	8-759-045-38	MC14538BCP (MOTOROLA)	Q9	8-729-201-04	2SC2878
IC501	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q11	8-729-201-04	2SC2878
IC502	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q12	8-729-201-04	2SC2878
IC503	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q13	8-729-201-04	2SC2878
IC504	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q14	8-729-201-04	2SC2878
IC505	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q15	8-729-201-04	2SC2878
IC506	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q16	8-729-201-04	2SC2878
IC507	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q18	8-729-201-04	2SC2878
IC508	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q19	8-729-201-04	2SC2878
IC509	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q501	8-729-201-04	2SC2878
IC510	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q502	8-729-201-04	2SC2878
IC511	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q503	8-729-201-04	2SC2878
IC512	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q504	8-729-201-04	2SC2878
IC513	8-759-240-66	TC4066BP (CD4066BE; RCA)			
IC514	8-759-240-66	TC4066BP (CD4066BE; RCA)	R69	1-212-712-00	METAL 270K 1% 1/2W
IC515	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R87	1-214-961-00	METAL 750K 1% 1/2W
IC516	8-759-240-66	TC4066BP (CD4066BE; RCA)	R90	1-214-961-00	METAL 750K 1% 1/2W
IC517	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R222	1-212-526-00	METAL 510 1% 1/2W
IC518	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	R223	1-212-526-00	METAL 510 1% 1/2W
IC519	8-759-132-40	$\mu$ PC324C (LM324; NSC)			
IC520	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R513	1-212-708-00	METAL 180K 1% 1/2W
IC521	8-759-240-66	TC4066BP (CD4066BE; RCA)	R514	1-212-708-00	METAL 180K 1% 1/2W
IC522	8-759-240-66	TC4066BP (CD4066BE; RCA)	R551	1-212-708-00	METAL 180K 1% 1/2W
IC523	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R552	1-212-708-00	METAL 180K 1% 1/2W
IC524	8-759-240-66	TC4066BP (CD4066BE; RCA)	R589	1-212-707-00	METAL 150K 1% 1/2W
IC525	8-759-240-66	TC4066BP (CD4066BE; RCA)			
IC526	8-759-240-01	TC4001BP (CD4001BE; RCA)	R605	1-212-707-00	METAL 150K 1% 1/2W
IC527	8-759-240-11	TC4011BP (CD4011BE; RCA)	R620	1-212-715-00	METAL 360K 1% 1/2W
IC528	8-759-045-38	MC14538BCP (MOTOROLA)	R622	1-212-715-00	METAL 360K 1% 1/2W
IC529	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R624	1-212-712-00	METAL 270K 1% 1/2W
IC530	8-759-240-01	TC4001BP (CD4001BE; RCA)	R636	1-214-961-00	METAL 750K 1% 1/2W
IC531	8-759-240-66	TC4066BP (CD4066BE; RCA)			
IC532	8-759-240-66	TC4066BP (CD4066BE; RCA)	R653	1-212-712-00	METAL 270K 1% 1/2W
IC533	8-759-240-11	TC4011BP (CD4011BE; RCA)	R665	1-214-961-00	METAL 750K 1% 1/2W
IC534	8-759-045-38	MC14538BCP (MOTOROLA)			
IC535	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV1	1-224-253-XX	VAR, METAL 22K
IC536	8-759-045-38	MC14538BCP (MOTOROLA)	RV2	1-224-253-XX	VAR, METAL 22K
IC537	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV501	1-224-251-XX	VAR, METAL 4.7K
IC538	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV502	1-224-252-XX	VAR, METAL 10K
IC539	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV503	1-224-251-XX	VAR, METAL 4.7K
			RV504	1-224-252-XX	VAR, METAL 10K



# SA-9, SR-17, SV-24-1 (CF-8)

Ref. No.	Parts No.	Description
<b>SA-9 BOARD</b>		
	1-604-377-00	PRINTED CIRCUIT BOARD, SA-9

S1	1-516-783-XX	SLIDE "LEVEL (A2)"
S2	1-516-777-XX	SLIDE "600 OHM (A2)"
S3	1-516-783-XX	SLIDE "LEVEL (A1)"
S4	1-516-777-XX	SLIDE "600 OHM (A1)"
S5	1-516-777-XX	SLIDE "FRAMING SERVO"
S6	1-516-777-XX	SLIDE "SERVO LOCK"
S7	1-516-777-XX	SLIDE "75 OHM (V)"

<b>SR-17 BOARD</b>		
	1-605-755-00	PRINTED CIRCUIT BOARD, SR-17

## SV-24-1 BOARD

 A-6715-160-B MOUNTED CIRCUIT BOARD,  
SV-24-1 (WITH CF-8)

	1-555-697-00	WIRE ASS'Y, FLAT 50P (25mm)
	1-564-392-00	HEADER, 50P (ON THE CF-8)
C9	1-102-110-00	CERAMIC 220PF 10% 50V
C31	1-161-342-00	CERAMIC 43PF SL 5% 50V
C35	1-130-224-00	POLYPROPYLENE 0.015 5% 50V
C39	1-102-114-00	CERAMIC 470PF B 10% 50V
C73	1-102-114-00	CERAMIC 470PF B 10% 50V
C103	1-161-267-00	CERAMIC 47PF SL 5% 50V

Ref. No.	Parts No.	Description
C104	1-161-267-00	CERAMIC 47PF SL 5% 50V
C108	1-102-106-00	CERAMIC 100PF B 10% 50V
C501	1-102-114-00	CERAMIC 470PF B 10% 50V
C502	1-102-110-00	CERAMIC 220PF B 10% 50V
C503	1-102-110-00	CERAMIC 220PF B 10% 50V
C504	1-102-114-00	CERAMIC 470PF B 10% 50V
C505	1-102-114-00	CERAMIC 470PF B 10% 50V
C506	1-102-114-00	CERAMIC 470PF B 10% 50V
C507	1-102-114-00	CERAMIC 470PF B 10% 50V
C508	1-102-114-00	CERAMIC 470PF B 10% 50V
C509	1-102-114-00	CERAMIC 470PF B 10% 50V
C510	1-102-114-00	CERAMIC 470PF B 10% 50V
C511	1-102-114-00	CERAMIC 470PF B 10% 50V
C512	1-102-114-00	CERAMIC 470PF B 10% 50V
C515	1-102-114-00	CERAMIC 470PF B 10% 50V
C516	1-102-114-00	CERAMIC 470PF B 10% 50V
C518	1-102-114-00	CERAMIC 470PF B 10% 50V
C522	1-102-114-00	CERAMIC 470PF B 10% 50V
C523	1-102-114-00	CERAMIC 470PF B 10% 50V
C539	1-161-267-00	CERAMIC 47PF 10% 50V

CP1	1-527-816-00	OSC 3.58 MHz (S/N. U/C: Up to 10350, J: Up to 10200)
	1-527-967-00	OSC 3.58 MHz (S/N. U/C: 10351 and higher, J: 10201 and higher) (S/N. PM: 10001 and higher)
D10	8-719-151-07	RD5.1E-B
D15	8-719-719-25	1S1925-P
D16	8-719-719-25	1S1925-P
D45	8-719-911-19	1SS119
D60	8-719-911-19	1SS119

IC1	8-759-145-58	μPC4558C (RC4558; RAYTHEON)
IC2	8-759-729-03	NJM2903D (JRC)
IC3	8-759-145-58	μPC4558C (RC4558; RAYTHEON)
IC4	8-759-132-40	μPC324C (LM324; NSC)
IC5	8-751-941-03	CX-194B-3 (SONY)
IC6	8-759-132-40	μPC324C (LM324; NSC)
IC7	8-759-131-11	μPC311C (NEC)
IC8	8-759-132-40	μPC324C (LM324; NSC)
IC9	8-759-131-11	μPC311C (NEC)
IC10	8-759-645-17	M54517P (MITSUBISHI)
IC11	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC12	8-759-045-38	MC14538BCP (MOTOROLA)
IC13	8-759-145-58	μPC4558C (RC4558; RAYTHEON)
IC14	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC15	8-759-241-61	TC40161BP (CD40161BE; RCA)

## E. PARTS

BVU-280/PM

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
<b>SY-36-1 or SY-92 BOARD</b>			IC41	8-759-245-28	TC4528BP (MC14528BCP; MOT)
	A-6717-292-B	MOUNTED CIRCUIT BOARD, SY-36-1 or SY-92	IC42	8-759-240-81	TC4081BP (CD4081BE; RCA)
			IC43	8-759-240-11	TC4011BP (CD4011BE; RCA)
			IC44	8-759-645-29	M54529P (MITSUBISHI)
			IC45	8-759-240-73	TC4073BP (CD4073BE; RCA)
			IC46	8-759-240-71	TC4071BP (CD4071BE; RCA)
C112	1-102-114-00	CERAMIC 470P 10% 50V	IC47	8-759-240-01	TC4001BP (CD4001BE; RCA)
C116	1-102-114-00	CERAMIC 470P 10% 50V	IC48	8-759-240-01	TC4001BP (CD4001BE; RCA)
C117	1-102-114-00	CERAMIC 470P 10% 50V	IC49	8-759-240-11	TC4011BP (CD4011BE; RCA)
			IC50	8-759-345-38	HD14538BP (HITACHI)
			IC51	8-759-240-68	TC4068BP (CD4068BE; RCA)
IC1	8-759-241-61	TC40161BP (CD40161BE; RCA)	IC52	8-759-240-23	TC4023BP (CD4023BE; RCA)
IC2	8-759-245-12	TC4512BP (MC14512BCP; MOT)	IC53	8-759-240-43	TC4043BP (CD4023BE; RCA)
IC3	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC54	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC4	8-759-240-11	TC4011BP (CD4011BE; RCA)	IC55	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC5	8-759-240-73	TC4073BP (CD4073BE; RCA)	IC56	8-759-645-29	M54529P (MITSUBISHI)
IC6	8-759-240-75	TC4075BP (CD4075BE; RCA)	IC57	8-759-240-93	TC4093BP (CD4093BE; RCA)
IC7	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC58	8-759-240-73	TC4073BP (CD4073BE; RCA)
IC8	8-759-245-12	TC4512BP (MC14512BCP; MOT)	IC59	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC9	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC60	8-759-645-29	M54529P (MITSUBISHI)
IC10	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	IC61	8-759-045-84	MC14584BCP (MOTOROLA)
IC11	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	IC62	8-759-645-29	M54529P (MITSUBISHI)
IC12	8-759-240-82	TC4082BP (CD4082BE; RCA)	IC63	8-759-240-27	TC4027BP (CD4027BE; RCA)
IC13	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	IC64	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC14	8-759-240-71	TC4071BP (CD4071BE; RCA)	IC65	8-759-240-82	TC4082BP (CD4082BE; RCA)
IC15	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC66	8-757-561-00	CX-756A (SONY)
IC16	8-759-240-43	TC4043BP (CD4043BE; RCA)	IC67	8-757-570-00	CX-757 (SONY)
IC17	8-759-240-71	TC4071BP (CD4071BE; RCA)	IC68	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC18	8-759-240-71	TC4071BP (CD4071BE; RCA)	IC69	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC19	8-759-240-73	TC4073BP (CD4073BE; RCA)	IC70	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC20	8-759-645-29	M54529P (MITSUBISHI)	IC71	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC21	8-759-240-25	TC4025BP (CD4025BE; RCA)	IC72	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC22	8-759-240-75	TC4075BP (CD4075BE; RCA)	IC73	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC23	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC74	8-759-240-75	TC4075BP (CD4075BE; RCA)
IC24	8-759-240-69	TC4069UBP (CD4069UBE; RCA)			
IC25	8-759-240-25	TC4025BP (CD4025BE; RCA)			
IC26	8-759-240-43	TC4043BP (CD4043BE; RCA)	Q1	8-729-201-04	2SC2878
IC27	8-759-645-29	M54529P (MITSUBISHI)			
IC28	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	RV1	1-226-096-00	VAR, METAL 500K
IC29	8-759-240-23	TC4023BP (CD4023BE; RCA)	RV2	1-224-940-00	VAR, METAL 10K
IC30	8-759-045-84	MC14584BCP (MOTOROLA)	RV3	1-226-096-00	VAR, METAL 500K
IC31	8-759-240-81	TC4081BP (CD4081BE; RCA)			
IC32	8-759-240-11	TC4011BP (CD4011BE; RCA)			
IC33	8-759-240-01	TC4001BP (CD4001BE; RCA)			
IC34	8-759-240-69	TC4069UBP (CD4069UBE; RCA)			
IC35	8-759-240-75	TC4075BP (CD4075BE; RCA)			
IC36	8-759-240-71	TC4071BP (CD4071BE; RCA)			
IC37	8-759-240-12	TC4012BP (CD4012BE; RCA)			
IC38	8-759-240-71	TC4071BP (CD4071BE; RCA)			
IC39	8-759-240-72	TC4072BP (CD4072BE; RCA)			
IC40	8-759-240-73	TC4073BP (CD4073BE; RCA)			

Ref. No.	Parts No.	Description
<b>SY-37-1 BOARD</b> (*: IC3, 6, 7, 72: Not handling at RPC)		
	A-6717-233-A	MOUNTED CIRCUIT BOARD, SY-37-1
C2	1-102-108-00	CERAMIC 150PF 10% 50V
C4	1-131-377-00	TANTALUM 10 20% 10V
C5	1-102-963-00	CERAMIC 33PF 5% 50V
C6	1-102-963-00	CERAMIC 33PF 5% 50V
CN31	1-560-454-31	40P
CN32	1-560-454-31	40P
D1	8-719-168-88	RD6.8F-B
D2	8-719-709-25	1S1925-P
D10	8-719-815-59	1S1555S
IC1	8-759-995-14	AM9513DC (AMD)
IC2	8-759-906-80	LH0080 (SHARP)
IC3	* 8-759-762-28	MBM2732U8201-4 (FUJITSU)
IC4	8-759-906-84	LH0084 (SHARP)
IC5	8-759-995-19	AM9519APC (AMD)
IC6	* 8-759-762-30	MBM2732U8203-4 (FUJITSU)
IC7	* 8-759-762-29	MBM2732U8202-4 (FUJITSU)
IC8	8-759-921-28	MSM2128-1AS (OKI)
IC9	8-759-926-31	AM26LS31PC (AMD)
IC10	8-759-926-32	AM26LS32PC (AMD)
IC11	8-759-902-44	SN74LS244N (TI)
IC12	8-759-901-39	SN74LS139N (TI)
IC14	8-759-045-98	MC14598BCP (MOTOROLA)
IC15	8-759-974-07	SN7407N (TI)
IC16	8-759-902-44	SN74LS244N (TI)
IC17	8-759-900-74	SN74LS74AN (TI)
IC18	8-759-902-44	SN74LS244N (TI)
IC19	8-759-045-98	MC14598BCP (MOTOROLA)
IC20	8-759-903-78	SN74LS378N (TI)
IC21	8-759-903-77	SN74LS377N (TI)
IC22	8-759-801-11	LB1261 (SANYO)
IC23	8-759-801-11	LB1261 (SANYO)
IC24	8-759-045-98	MC14598BCP (MOTOROLA)
IC25	8-759-900-05	SN74LS05N (TI)
IC26	8-759-903-77	SN74LS377N (TI)
IC27	8-759-220-74	TC40H074P (TOSHIBA)
IC28	8-759-240-20	TC4020BP (CD4020BE; RCA)
IC29	8-759-902-44	SN74LS244N (TI)
IC30	8-759-045-98	MC14598BCP (MOTOROLA)
IC31	8-759-900-05	SN74LS05N (TI)
IC32	8-759-903-77	SN74LS377N (TI)
IC33	8-759-900-32	SN74LS32N (TI)
IC34	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC35	8-759-692-44	M74LS244P
IC36	8-759-045-98	MC14598BCP (MOTOROLA)

Ref. No.	Parts No.	Description
IC37	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC38	8-759-903-77	SN74LS377N (TI)
IC39	8-759-045-84	MC14584BCP (MOTOROLA)
IC40	8-759-902-44	SN74LS244N (TI)
IC41	8-759-045-98	MC14598BCP (MOTOROLA)
IC42	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC43	8-759-903-77	SN74LS377N (TI)
IC44	8-759-901-38	SN74LS138N (TI)
IC45	8-759-729-03	NJM2903D (JRC)
IC46	8-759-902-44	SN74LS244N (TI)
IC48	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC49	8-759-903-77	SN74LS377N (TI)
IC50	8-759-901-38	SN74LS138N (TI)
IC51	8-759-223-68	TC40H368P (TOSHIBA)
IC52	8-759-902-44	SN74LS244N (TI)
IC53	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC54	8-759-903-77	SN74LS377N (TI)
IC55	8-759-901-38	SN74LS138N (TI)
IC56	8-759-903-77	SN74LS377N (TI)
IC57	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC58	8-759-903-77	SN74LS377N (TI)
IC59	8-759-901-38	SN74LS138N (TI)
IC60	8-759-901-38	SN74LS138N (TI)
IC61	8-759-100-54	μPA54H (NEC)
IC62	8-759-100-64	μPA64H (NEC)
IC63	8-759-100-54	μPA54H (NEC)
IC64	8-759-100-64	μPA64H (NEC)
IC65	8-759-901-58	SN74LS158N (TI)
IC66	8-759-901-58	SN74LS158N (TI)
IC70	8-759-926-31	AM26LS31PC (AMD)
IC71	8-759-926-32	AM26LS32PC (AMD)
IC72	* 8-759-762-31	MBM2732U8204-4 (FUJITSU)
Q2	8-729-315-63	2SB856
Q3	8-729-663-48	2SC1364-8
S1	1-553-542-00	KEY "RESET"
S2	1-516-923-00	DIP
S3	1-553-076-00	SLIDE
S5	1-516-925-21	DIP "EIA/CCIR"

X1	1-527-827-00	4.9152MHz
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Ref. No.	Parts No.	Description
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## SY-71 BOARD

	A-6717-208-A	MOUNTED CIRCUIT BOARD, SY-71
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C13	1-123-299-00	ELECT 1000 20% 6.3V
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D8	8-719-200-02	10E-2
D9	8-719-200-02	10E-2
D10	8-719-200-02	10E-2
D13	8-719-200-02	10E-2
D14	8-719-200-02	10E-2

D15	8-719-200-02	10E-2
D18	8-719-200-02	10E-2
D19	8-719-200-02	10E-2
D20	8-719-200-02	10E-2
D23	8-719-200-02	10E-2

D24	8-719-200-02	10E-2
D25	8-719-200-02	10E-2
D29	8-719-200-02	10E-2
D31	8-719-200-02	10E-2
D33	8-719-200-02	10E-2

D34	8-719-200-02	10E-2
D35	8-719-200-02	10E-2
D38	8-719-200-02	10E-2
D40	8-719-200-02	10E-2
D42	8-719-200-02	10E-2

D43	8-719-200-02	10E-2
D44	8-719-200-02	10E-2
D47	8-719-200-02	10E-2
D48	8-719-200-02	10E-2
D49	8-719-200-02	10E-2

D54	8-719-200-02	10E-2
D55	8-719-200-02	10E-2
D56	8-719-200-02	10E-2
D57	8-719-200-02	10E-2
D58	8-719-200-02	10E-2

IC1	8-743-430-00	BX-343 (SONY)
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Ref. No.	Parts No.	Description
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Q2	8-729-103-43	2SB734
Q3	8-729-177-43	2SD774
Q6	8-729-103-43	2SB734
Q7	8-729-177-43	2SD774
Q10	8-729-177-43	2SD774

Q12	8-729-103-43	2SB734
Q13	8-729-177-43	2SD774
Q16	8-729-177-43	2SD774
Q17	8-729-103-43	2SB734
Q21	8-729-331-53	2SC2315

Q23	8-729-283-42	2SB834
Q24	8-729-331-53	2SC2315
Q26	8-729-283-42	2SB834
Q27	8-729-331-53	2SC2315
Q30	8-729-384-48	2SA844

Q32	8-729-103-43	2SB734
Q35	8-729-283-42	2SB834
Q36	8-729-331-53	2SC2315
Q40	8-729-283-42	2SB834
Q41	8-729-331-53	2SC2315

	R42	1-206-568-00	WIREWOUND 27 10% 5W
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	R43	1-206-568-00	WIREWOUND 27 10% 5W
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R57	1-244-865-00	CARBON 470 5% 1/2W
R61	1-244-865-00	CARBON 470 5% 1/2W
R70	1-244-865-00	CARBON 470 5% 1/2W

R84	1-217-020-00	CARBON 12 5% 3W
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## TC-12 BOARD

1-604-760-00	PRINTED CIRCUIT BOARD, TC-12
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F. PARTS

# TC-13, TM-4, TM-8

Ref. No. Parts No. Description

## TC-13 BOARD

\*1 A-6715-114-A MOUNTED CIRCUIT BOARD,  
TC-13  
\*2 A-6715-114-B MOUNTED CIRCUIT BOARD,  
TC-13

C11 1-102-114-00 CERAMIC 470PF 10% 50V  
C12 1-102-114-00 CERAMIC 470PF 10% 50V  
C13 1-102-114-00 CERAMIC 470PF 10% 50V  
C210 1-102-114-00 CERAMIC 470PF 10% 50V

D103 8-719-709-25 1S1925-P  
D104 8-719-709-25 1S1925-P

IC1 8-759-245-10 TC4510BP (MC14510BCP; MOT)  
IC2 8-759-245-10 TC4510BP (MC14510BCP; MOT)  
IC3 8-759-245-10 TC4510BP (MC14510BCP; MOT)  
IC4 8-759-245-10 TC4510BP (MC14510BCP; MOT)  
IC5 8-759-245-10 TC4510BP (MC14510BCP; MOT)

IC6 8-759-245-10 TC4510BP (MC1451BCP; MOT)  
IC7 8-759-245-10 TC4510BP (MC14510BCP; MOT)  
IC8 8-759-240-23 TC4023BP (CD4023BE; RCA)  
IC9 8-759-240-71 TC4071BP (CD4071BE; RCA)  
IC10 8-759-240-69 TC4069UBP (CD4069UBE; RCA)

IC11 8-759-040-77 MC14077BCP (CD4077BE; RCA)  
IC12 8-759-240-27 TC4027BP (CD4027BE; RCA)  
IC13 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC14 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC15 8-759-245-12 TC4512BP (MC14512BCP; MOT)

IC16 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC17 8-759-240-81 TC4081BP (CD4081BE; RCA)  
IC18 8-759-240-73 TC4073BP (CD4073BE; RCA)  
IC19 8-759-240-71 TC4071BP (CD4071BE; RCA)  
IC20 8-759-145-19  $\mu$ PD4519C (MC14519BCP; MOT)

IC101 8-759-700-00 NJM4562DDR (JRC)  
IC102 8-751-300-00 CX-130 (SONY)  
IC103 8-765-222-20 2SC1963 (SONY)  
IC104 \*2 8-759-100-22  $\mu$ PA76V-FA (NEC)  
IC201 8-749-909-15 BX-3915A (SONY)  
IC202 8-759-045-38 MC14538BCP (MOTOROLA)

IC203 8-759-245-39 TC4539BP (MC14539BCP; MOT)  
IC204 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC205 8-759-240-01 TC4001BP (CD4001BE; RCA)

Ref. No. Parts No. Description

Q102 8-729-201-04 2SC2878  
Q105 8-729-201-04 2SC2878  
Q108 8-729-201-04 2SC2878  
Q116 8-729-201-04 2SC2878

R153 1-244-849-00 CARBON 100 5% 1/2W

RV101 1-224-252-XX VAR, METAL 10K  
RV102 1-224-254-XX VAR, METAL 47K  
RV103 \*1 1-224-254-XX VAR, METAL 47K  
\*2 1-224-247-XX VAR, METAL 100

## TM-4 BOARD

1-604-367-00 PRINTED CIRCUIT BOARD,  
TM-4

## TM-8 BOARD

1-604-364-00 PRINTED CIRCUIT BOARD,  
TM-8

E. PARTS

NOTE; \*1 Serial No. 10,001 to 10,050 (J)  
Serial No. 10,001 to 10,100 (U/C)  
\*2 Serial No. 10,051 and higher (J)  
Serial No. 10,101 and higher (U/C)  
Serial No. 10,001 and higher (PM)

Ref. No.	Parts No.	Description
<b>WL-1 BOARD</b>		
	1-604-366-00	PRINTED CIRCUIT BOARD, WL-1
<b>D1</b>	<b>8-719-812-44</b>	<b>TLO124</b>
<b>PL1</b>	<b>1-518-386-00</b>	<b>5V 30mA</b>
<b>PL2</b>	<b>1-518-386-00</b>	<b>5V 30mA</b>
<b>YD-10 BOARD</b>		
	A-6711-306-A	MOUNTED CIRCUIT BOARD, YD-10
<b>C47</b>	<b>1-109-690-00</b>	<b>MICA 510PF 1% 500V</b>
<b>C223</b>	<b>1-130-201-00</b>	<b>FILM 0.068 5% 50V</b>
<b>CP1</b>	<b>1-527-976-00</b>	<b>OSC. 8.5MHz</b>
<b>D3</b>	<b>8-719-100-27</b>	<b>RD4.7E-B2</b>
<b>D18</b>	<b>8-719-709-25</b>	<b>1S1925P</b>
<b>D19</b>	<b>8-719-709-25</b>	<b>1S1925P</b>
<b>DL2</b>	<b>1-415-242-00</b>	<b>40nS</b> (S/N. up to 10550 (U/C)) (S/N. up to 10200 (J))
<b>DL2</b>	<b>1-415-162-00</b>	<b>50nS</b> (S/N. 10551 to 11195 (U/C)) (S/N. 10201 to 10400 (J)) (S/N. up to 10005 (PM))
<b>DL2</b>	<b>1-415-162-21</b>	<b>50nS</b> (S/N. 11196 and higher (U/C)) (S/N. 10401 and higher (J)) (S/N. 10006 and higher (PM))
<b>DL3</b>	<b>1-415-136-00</b>	<b>1H</b>

Ref. No.	Parts No.	Description
<b>FL1</b>	<b>1-231-581-00</b>	<b>HIGH-PASS</b> (S/N. up to 11195 (U/C)) (S/N. up to 10400 (J)) (S/N. up to 10005 (PM))
<b>FL1</b>	<b>1-231-581-21</b>	<b>HIGH-PASS</b> (S/N. 11196 and higher (U/C)) (S/N. 10401 and higher (J)) (S/N. 10006 and higher (PM))
<b>FL2</b>	<b>1-235-002-00</b>	<b>LOW PASS</b>
<b>FL3</b>	<b>1-235-044-00</b>	<b>LOW PASS</b>
<b>IC1</b>	<b>8-751-340-00</b>	<b>CX-134A (SONY)</b>
<b>IC2</b>	<b>8-751-300-00</b>	<b>CX-130 (SONY)</b>
<b>IC3</b>	<b>8-751-300-00</b>	<b>CX-130 (SONY)</b>
<b>IC4</b>	<b>8-729-677-14</b>	<b>2SC2771 (MITSUBISHI)</b>
<b>IC5</b>	<b>8-759-045-38</b>	<b>MC14538BCP (MOTOROLA)</b>
<b>IC6</b>	<b>8-759-270-69</b>	<b>TA7069P (TOSHIBA)</b>
<b>IC7</b>	<b>8-751-350-00</b>	<b>CX-135 (SONY)</b>
<b>IC8</b>	<b>8-751-300-00</b>	<b>CX-130 (SONY)</b>
<b>IC9</b>	<b>8-759-270-76</b>	<b>TA7076P (TOSHIBA)</b>
<b>IC10</b>	<b>8-759-270-60</b>	<b>TA7060P (TOSHIBA)</b>
<b>IC11</b>	<b>8-759-969-13</b>	<b>SN16913P (TI)</b>
<b>IC12</b>	<b>8-759-240-11</b>	<b>TC4011BP (CD4011BE; RCA)</b>
<b>IC13</b>	<b>8-751-300-00</b>	<b>CX-130 (SONY)</b>
<b>L11</b>	<b>1-408-654-00</b>	<b>1mH</b>
<b>L25</b>	<b>1-407-167-61</b>	<b>MICRO 68μH</b>
<b>L28</b>	<b>1-407-168-61</b>	<b>MICRO 82μH</b>
<b>L34</b>	<b>1-407-168-61</b>	<b>MICRO 82μH</b>
<b>LV1</b>	<b>1-407-285-00</b>	<b>VAR. 1.5mH</b>
	<b>1-407-268-00</b>	<b>VAR. 1.5mH</b>
<b>Q1</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q3</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q4</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q5</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q6</b>	<b>9-724-375-01</b>	<b>2SC403C</b>
<b>Q7</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q8</b>	<b>8-729-384-48</b>	<b>2SA844</b>
<b>Q9</b>	<b>8-729-663-47</b>	<b>2SC1364</b>
<b>Q10</b>	<b>8-729-384-48</b>	<b>2SA844</b>
<b>Q11</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q12</b>	<b>8-729-384-48</b>	<b>2SA844</b>
<b>Q13</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q15</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q16</b>	<b>8-724-375-01</b>	<b>2SC403C</b>
<b>Q17</b>	<b>8-724-375-01</b>	<b>2SC403C</b>

## E. PARTS

Ref. No.	Parts No.	Description
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Q18	8-724-375-01	2SC403C
Q19	8-724-375-01	2SC403C
Q20	8-724-375-01	2SC403C
Q21	8-769-193-09	2SK43-3
Q22	8-729-384-48	2SA844

Q23	8-729-384-48	2SA844
Q24	8-729-384-48	2SA844
Q25	8-724-375-01	2SC403C
Q26	8-724-375-01	2SC403C
Q27	8-724-375-01	2SC403C

Q28	8-724-375-01	2SC403C
Q29	8-724-375-01	2SC403C
Q30	8-724-375-01	2SC403C
Q31	8-729-384-48	2SA844
Q32	8-724-375-01	2SC403C

Q33	8-729-384-48	2SA844
Q34	8-724-375-01	2SC403C
Q35	8-729-384-48	2SA844
Q36	8-724-375-01	2SC403C
Q38	8-724-375-01	2SC403C

Q39	8-724-375-01	2SC403C
Q40	8-724-375-01	2SC403C
Q41	8-724-375-01	2SC403C
Q42	8-724-375-01	2SC403C
Q43	8-724-375-01	2SC403C

Q44	8-724-375-01	2SC403C
Q45	8-724-375-01	2SC403C
Q46	8-724-375-01	2SC403C
Q47	8-724-375-01	2SC403C
Q48	8-724-375-01	2SC403C

Q49	8-724-374-01	2SC403C
Q50	8-729-384-48	2SA844
Q51	8-729-201-05	2SC2878-B
Q52	8-724-375-01	2SC403C

Q53	8-724-375-01	2SC403C
Q54	8-724-375-01	2SC403C
Q55	8-724-375-01	2SC403C
Q56	8-761-622-00	2SC1636
Q57	8-729-201-04	2SC2878

R11	1-244-843-00	CARBON 56 1/2W 5%
R45	1-244-861-00	CARBON 330 1/2W 5%
R46	1-244-861-00	CARBON 330 1/2W 5%
R247	1-212-709-00	METAL 200K 1/2W 1%

Ref. No.	Parts No.	Description
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RV1	1-224-248-XX	VAR, METAL 470
RV2	1-224-248-XX	VAR, METAL 470
RV3	1-224-251-XX	VAR, METAL 4.7K
RV4	1-224-250-XX	VAR, METAL 2.2K
RV5	1-224-251-XX	VAR, METAL 4.7K

RV7	1-224-252-XX	VAR, METAL 10K
RV8	1-224-251-XX	VAR, METAL 4.7K
RV10	1-224-489-21	VAR, METAL 2.2K
RV11	1-224-660-21	VAR, METAL 1K
RV12	1-224-254-XX	VAR, METAL 47K

RV13	1-224-250-XX	VAR, METAL 2.2K
RV15	1-224-250-XX	VAR, METAL 2.2K
RV16	1-224-255-XX	VAR, METAL 100K
RV17	1-224-254-XX	VAR, METAL 47K
RV18	1-224-252-XX	VAR, METAL 10K

RV19	1-224-250-XX	VAR, METAL 2.2K
RV20	1-224-251-XX	VAR, METAL 4.7K
RV21	1-224-252-XX	VAR, METAL 10K

S1	1-552-509-00	SWITCH, DIP
S2	1-552-509-00	SWITCH, DIP



Ref. No. Parts No. Description

## FRAME (REF. NO. 200 SERIES)

A-6742-034-A DETECTOR T ASS'Y  
(WITH LE-4B, PH-1B)  
A-6742-036-B DETECTOR S ASS'Y  
(WITH LE-4A, PH-1A)

### 1-526-572-00 VOLTAGE SELECTOR

1-555-698-00 WIRE ASS'Y, FLAT 40P (100mm)  
SY-37 TO KY-9  
1-555-699-00 WIRE ASS'Y, FLAT 40P (160mm)  
MB-36 TO MB-9

CN201 1-509-891-00 BNC "VIDEO OUT 1"  
CN202 1-509-891-00 BNC "VIDEO OUT 2"  
CN203 1-509-891-00 BNC "RF (OFF TAPE)"  
CN204 1-509-176-00 XLR-3P (M) "AUDIO OUT (CH-1/R)"  
(for U/C, PM)  
1-509-184-00 XLR-3P (F) "AUDIO OUT (CH-1/R)"  
(for J)

CN205 1-509-176-00 XLR-3P (M) "AUDIO OUT (CH-2/R)"  
(for U/C, PM)  
1-509-184-00 XLR-3P (F) "AUDIO OUT (CH-2/R)"  
(for J)

CN206 1-509-176-00 XLR-2P (M) "AUDIO OUT  
(MONITOR)" (for U/C, PM)  
1-509-184-00 XLR-3P (F) "AUDIO OUT  
(MONITOR)" (for J)

CN207 1-509-095-00 8P "MONITOR"  
CN208 1-561-045-00 7P (F) "DUB OUT"  
CN209 1-508-945-00 7P (M) "DUB IN"  
CN210 1-509-471-00 18P (F) "TBC"  
CN211 1-509-891-00 BNC "SC IN"

CN212 1-509-891-00 BNC "VIDEO IN 1"  
CN213 1-509-891-00 BNC "VIDEO IN 2"  
CN214 1-509-891-00 BNC "EXT SYNC IN"  
CN215 1-507-142-XX PIN JACK, 2P "TIME CODE  
IN/OUT"

CN216 1-509-184-00 XLR-3P (F) "AUDIO IN (CH-1/L)"  
(for U/C, PM)  
1-509-176-00 XLR-3P (M) "AUDIO IN (CH-1/L)"  
(for J)  
CN217 1-509-184-00 XLR-3P (F) "AUDIO IN (CH-2/R)"  
(for U/C, PM)  
1-509-176-00 XLR-3P (M) "AUDIO IN (CH-2/R)"  
(for J)

 CN221 1-509-546-00 3P (M) "AC IN" (for U/C, PM)  
1-509-801-00 2P (M) "AC IN" (for J)

Ref. No. Parts No. Description

CS201 1-586-633-00 CONDENSATION SENSOR

DME201 8-745-203-00 DM203 "CAPSTAN"

H201 8-829-358-35 EPP150-5803B "AUDIO/CTL"  
H202 8-829-371-11 PP171-5802D "TIME CODE R/P"  
H203 8-825-544-10 EF232-58 "FULL ERASE"

(S/N. Up to 10745 (U/C))  
(S/N. Up to 10200 (J))  
(S/N. Up to 10005 (PM))

H203 8-825-544-20 EF248-58 "FULL ERASE"  
(S/N. 10746 and higher (U/C))  
(S/N. 10201 and higher (J))  
(S/N. 10006 and higher (PM))

H204 A-6709-406-A DUR-25-R, UPPER DRUM  
"VIDEO"

 M201 1-541-104-00 PE2B55 "FAN"

(S/N. Up to 10745 (U/C))  
(S/N. Up to 10250 (J))  
(S/N. Up to 10005 (PM))

 M201 1-541-104-51 PE2B55 "FAN"

(S/N. 10746 to 11375 (U/C))  
(S/N. 10251 to 10440 (J))  
(S/N. 10006 to 10010 (PM))  
1-541-264-11 "FAN" DC  
(S/N. 11376 and higher (U/C))  
(S/N. 10441 and higher (J))  
(S/N. 10011 and higher (PM))

M201

M202 8-835-056-01 DNR-1002A "THREADING"  
M203 A-6709-404-A DUH-25A-R, HEAD ASS'Y  
"DRUM"

M204 8-838-019-01 BHF-1600A "CAPSTAN"  
M205 8-835-050-01 MNR-4400A "T REEL"

M206 8-835-050-01 MNR-4400A "S REEL"  
M207 8-835-055-01 DNR-4700A "CASSETTE C"

ME201 1-520-438-00 "VIDEO/RF"  
ME202 1-520-439-00 "AUDIO CH-1"  
ME203 1-520-439-00 "AUDIO CH-2"

PL201 1-518-461-00 14V, 50mA "METER LAMP"  
PL202 1-518-461-00 14V, 50mA "METER LAMP"  
PL203 1-518-461-00 14V, 50mA "METER LAMP"  
PL204 1-518-461-00 14V, 50mA "METER LAMP"  
PL205 1-518-461-00 14V, 50mA "METER LAMP"

PL206 1-518-461-00 14V, 50mA "METER LAMP"  
PL207 1-518-455-00 12V, 55mA "CASSETTE LAMP"  
PL208 1-518-455-00 12V, 55mA "CASSETTE LAMP"  
PL209 1-518-455-00 12V, 55mA "CASSETTE LAMP"

E PARTS

# FRAME

Ref. No.	Parts No.	Description
PM201	1-454-279-00	12.4V 11 OHM "S TENSION"
PM202	1-454-278-00	11.3V 21 OHM "SKEW"
PM203	1-454-278-00	11.3V 21 OHM "S BRAKE"
PM204	1-454-278-00	11.3V 21 OHM "T BRAKE"
PM205	1-454-276-00	12V 40 OHM "PINCH"
RV201	1-226-616-00	VAR, 100K "TRACKING"
RV202	1-224-691-XX	VAR, 10K "VIDEO LEVEL"
RV203	1-228-140-00	VAR, 20K x 2 "AUDIO LEVEL (CH-1)"
RV204	1-228-140-00	VAR, 20K x 2 "AUDIO LEVEL (CH-2)"

**S201 1-553-515-21 ROCKER "POWER"**

**T201 1-446-938-00 "FAN"**

(S/N. 10001 to 11375(U/C)  
S/N. 10001 to 10440 (J)  
S/N. 10001 to 10010 (PM))

**TM201 1-548-100-11 "HOURS METER"**

Ref. No. Parts No. Description

## 18-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

**A-6724-244-A EXTENSION BOARD ASS'Y, EX-7**  
1-561-654-00 CONNECTOR, CARD, 86P  
2-251-622-00 LEVER, PC BOARD

**1-551-812-00 CORD POWER (FOR U/C, PM)**

**1-551-114-XX CORD POWER (DK-28) (FOR J)**

3-668-443-00 CUSHION, UPPER  
(SERIAL No. Up to **NOTE 1**)  
3-668-443-04 CUSHION, UPPER  
(SERIAL No. **NOTE 2** and higher)  
3-668-440-00 SPACER  
3-668-446-00 CUSHION, REAR  
(SERIAL No. Up to **NOTE 1**)  
3-683-616-03 CUSHION (REAR), LOWER  
(SERIAL No. **NOTE 2** and higher)

3-668-447-00 CUSHION, FRONT  
(SERIAL No. Up to **NOTE 1**)  
3-683-615-03 CUSHION (FRONT), LOWER  
(SERIAL No. **NOTE 2** and higher)  
3-668-468-00 CARTON, INDIVIDUAL  
(SERIAL No. Up to **NOTE 1**)  
3-668-468-04 CARTON, INDIVIDUAL  
(SERIAL No. **NOTE 2** and higher)  
3-672-917-00 BOARD PICK  
(SERIAL No. Up to **NOTE 1**)

3-688-812-01 SPACER SIDE  
(U/C ----- S/N 11376 and higher)  
(J ----- S/N 10411 and higher)  
(PM ----- S/N 10011 and higher)

**3-701-649-00 BAG, POLY (FOR BVU-820, 820PM)**

STANDARD PRODUCTS DUBBING CABLE (VDC-5)

**1-508-948-00 PLUG, 7P, MALE**  
**1-561-055-00 PLUG, 7P, FEMALE**

STANDARD PRODUCTS 9 PIN, REMOTE

**1-560-651-00 CONTROL CABLE (RCC-5G)**  
**1-561-749-00 PLUG, 9P, MALE**  
**SHELL**

### NOTE:

- |                   |                   |
|-------------------|-------------------|
| 1. U/C --- #11295 | 2. U/C --- #11296 |
| J --- #10420      | J --- #10421      |
| PM --- #10010     | PM --- #10011     |

E. PARTS